DECEMBER 1961

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

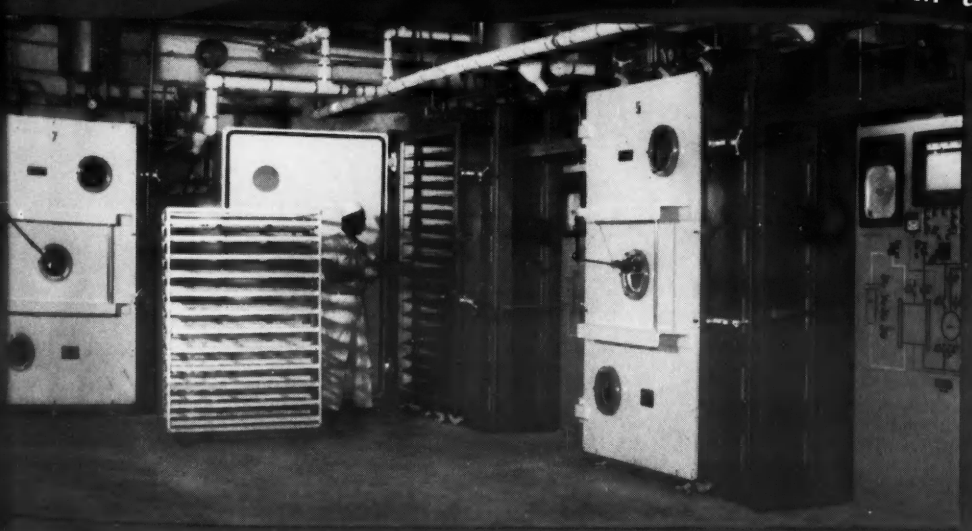
Food oil market upset by rush to polyunsaturates; new supply-demand-price structure evolving... 63

FOOD PROCESSING®

Cocktail from freeze-dried shrimp is as good as it looks. Other United Fruit freeze-dried products: chicken, beefsteak, sandwiches, whole vegetables. More to come

FASTER FREEZE-DRYING

at United Fruit with all-radiant heating... 25



ANNUAL PUBLICATION | "Executive Magazine for Industry"

*When all is said and done... there is just one thought at this time of year—

Merry Christmas

and every good wish for the new year

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that's interesting

Everything but the 'homemaker'

Almost all of the conveniences of home are incorporated in Whirlpool Corporation's experimental space kitchen — now on display at New York's Museum of Natural History as part of the Aries Earth Satellite exhibit.

Designed to feed five for an indefinite period, the kitchen contains in its six-by-six-ft dimension refrigeration, freezing, heating, storage and hot and cold running water. In addition, special feeding apparatus such as a ratchet feeding mechanism, mouthpiece and feeding trays prevent the comestibles from orbiting about the cabin.

Solves the problem of dining 'out'

Light meals may be fine on earth, but foods that float by due to a weightless environment can be a vexing problem to the hungry astronaut on a prolonged space flight.

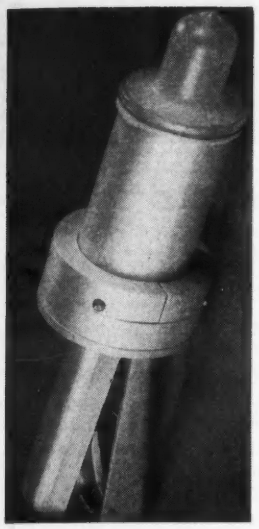
To solve the dining-out-in-space problem, Continental Can Company's Metal Research & Development Department in Chicago, on sub-contract from Whirlpool Corp., St. Joseph, Mich., has come up with a special space-feeding system.

Pictured as it might appear to the supping spaceman, nipple- or mouthpiece-end uppermost, the system also in

that's interesting

cludes a six-oz metal container (below mouthpiece) and a plunger-like device (bottom of assembly).

Cans come with removable plastic ends, and with a plastic piston incorporated inside and



at bottom of can. Food is expelled through mouthpiece when plunger at bottom breaks the can's scored bottom end and pushes against the plastic piston.

Cracks egg mystery

A discovery by USDA scientists helps solve a mystery that has plagued egg producers for years — why washing eggs in water seems to increase spoilage in some instances, but not in others.

The scientists found that rate and extent of egg spoilage is increased by washing them in water that contains a high concentration of iron, five to ten ppm in solution.

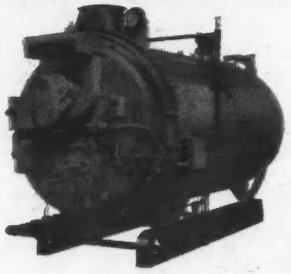
Wash water containing excess iron carries this iron through the shell and shell membrane into the inner egg tissue. Here, iron reverses the protective action of an egg's conalbumin — the iron-binding protein in egg white — and accelerates spoilage.

Package steam makes processing more profitable

Four Cleaver-Brooks boilers supply steam for A. F. Murch Company, Paw Paw, Michigan, to make the processing of grapes, apples, cherries more efficient.

For nearly ten years, A. F. Murch Co. has been a volume producer of single strength grape juice. Steam was used to preheat the grape pulp and to pasteurize the finished juice. Within the first two years of production, volume doubled. And, as business grew, new products were added, and more steam was needed. Each time A. F. Murch turned to Cleaver-Brooks.

In the words of Mr. J. A. Murch: "Rather than build additional cold storage facilities to store single strength juice, we thought it might be possible to take the juice in the fall of the year and concentrate it, thus eliminating the need for any more cold storage tanks. In 1957, we installed our FOURTH Cleaver-Brooks boiler — a 600 horsepower unit — this one for the purpose of evaporating water out of the fruit juice.



"The process worked out very well . . . has increased the volume of fruit we can handle . . . including apples, crabapples and cherries through this same equipment."

As A. F. Murch Company grows, Cleaver-Brooks boilers will continue to supply low-cost steam through efficient performance. Cleaver-Brooks boilers meet the highest test of engineering excellence. Each boiler is assembled and tested as a unit before shipment and is started by a factory-trained specialist.

Exclusive features, found only on Cleaver-Brooks boilers, assure you of greater efficiency, more dependable performance than any other boiler. Contact your Cleaver-Brooks agent for details, or write Cleaver-Brooks Company, Dept. P, 357 E. Keefe Avenue, Milwaukee 12, Wisconsin.

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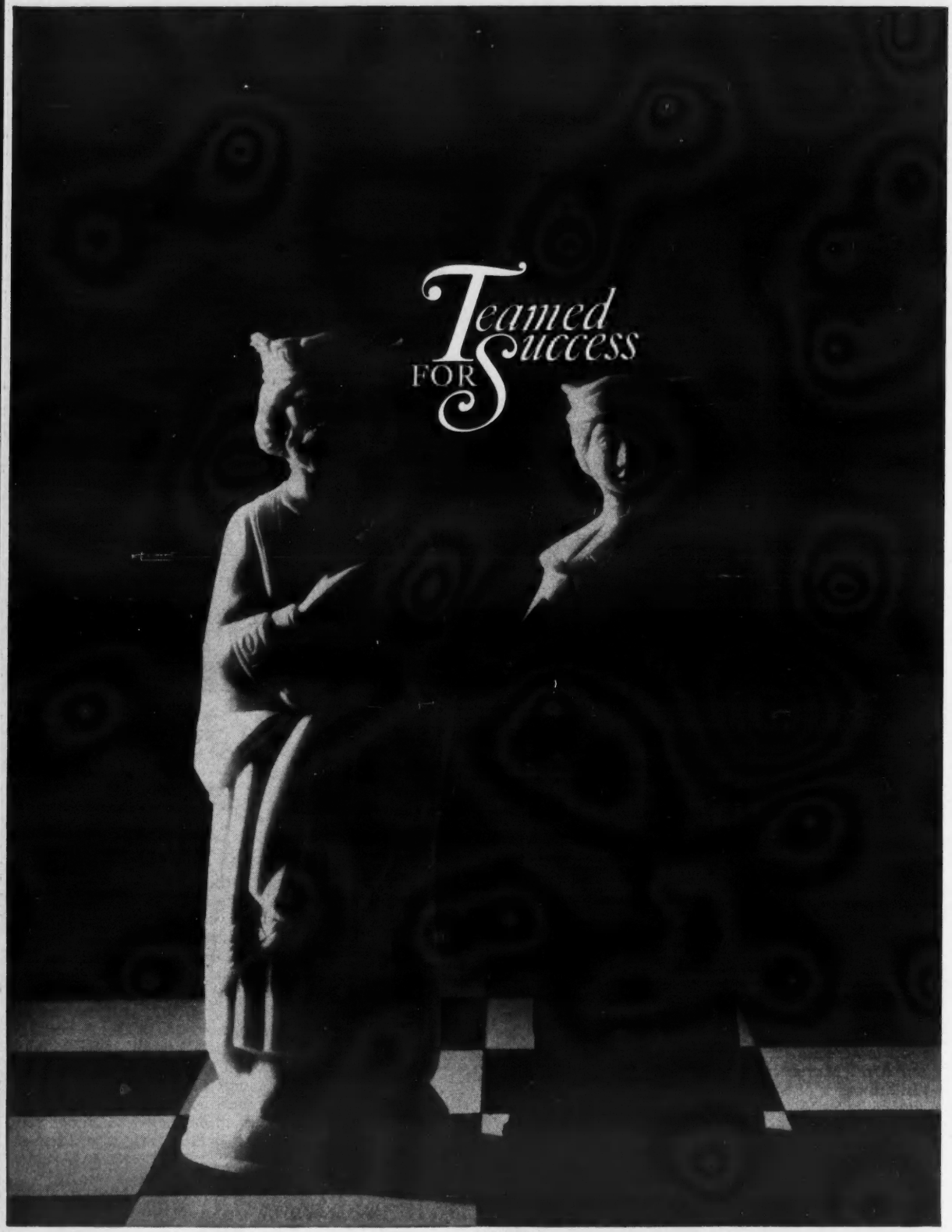

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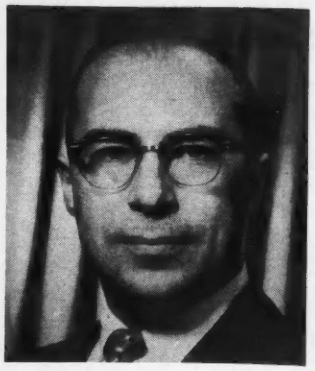
over the editor's shoulder



Toward 'togetherness'

Unitized Shipping could stand a great deal more "unitized thinking." This is the impression this editor received after inviting various food industry handling-shipping authorities to comment on the subject.

The response — when it was provided — indicates that there still is considerable hesitation concerning this vital dollars-and-cents subject, or possibly reluctance to discuss still-experimental developments.

However, some executives did respond to the inquiry — almost in all cases from the industry's distribution segment. Their very penetrating comments are incorporated in the article beginning on pages 32 and 33.

Coming soon — a major article on what the giant meat-packing industry is doing about unitizing shipments. Also — the practical possibilities of pallet pools, with case-history examples.

And there'll be more — as FOOD PROCESSING will continue what it began in May 1959 — to probe this sensitive area of the food industry.

Norb Lenien

ASSOCIATE EDITOR

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

DECEMBER 1961
VOL. 22, NO. 12

FOOD PROCESSING

CIRCULATION OVER 39,000

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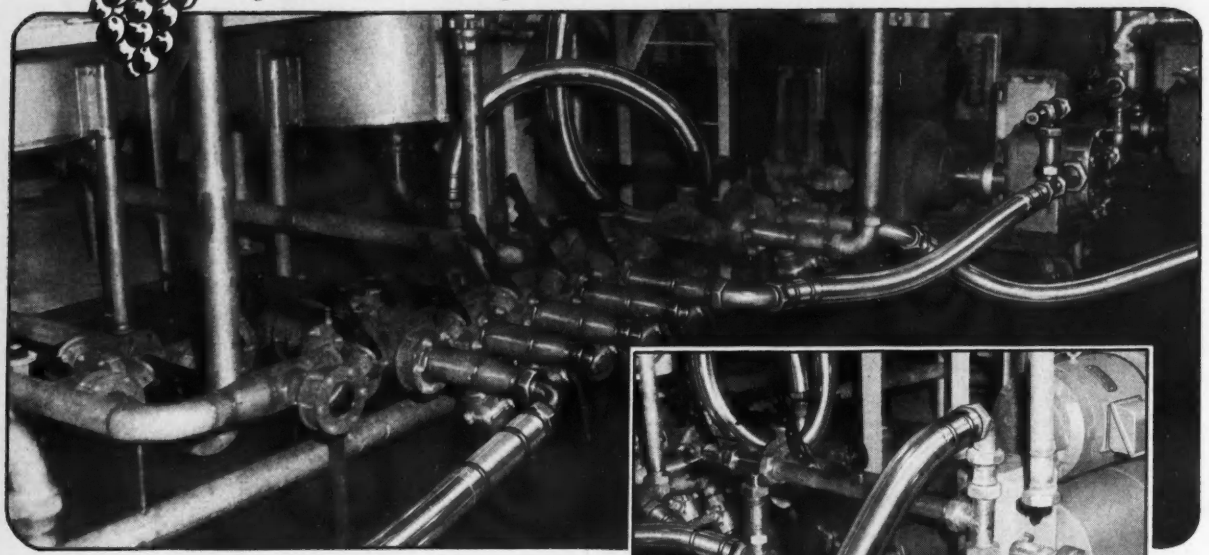
Grape Juice Processor finds

NEW WAYS TO CUT COSTS



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Close-up of positive pump in main illustration shows flexibility of Tygon hose, facilitating fast, easy set-ups with a minimum of fittings.

Glass-clear, flexible, non-toxic Tygon Food and Beverage Hose (Formulation B44-3) has reduced costs for canners, packers and bottlers of all sizes. In addition to conventional applications, The A. F. Murch Company, Paw Paw, Michigan, processor of grape juice concentrate, has used Tygon's unique combination of advantages in unusual ways to get even greater savings.

For example, alert Murch production men took advantage of Tygon's flexibility and ease of coupling to put wheeled platforms under the positive pumps used to transfer juice between process equipment and storage tanks. Now, with Tygon Food and Beverage Hose on both vacuum and discharge sides of the pumps, change-over is a quick and easy process of uncoupling Tygon lines, rolling the pump a short distance and re-coupling Tygon to the proper fittings. Time required? Much less than with rigid pipe. Added benefits: fewer pumps needed, and visual inspection and control of flow afforded by Tygon's clarity.

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FOOD PROCESSING

(Food Processing Preview)

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Alcoa has worked with the major can manufacturers in developing a clad alloy series that exhibits the best physical properties and surface conditions available to the container manufacturing industry. The new clad sheet utilizes a "core" material of high strength aluminum-magnesium alloy and a relatively high purity aluminum alloy—free of magnesium—that is metallurgically bonded to one or both sides of the "core" during the preliminary ingot phases of rolling aluminum can stock. The result is a clean sheet specifically tailored to meet the subsequent rigorous and complex operations carried out by the container manufacturer.

The cladding eliminates variations in surface characteristics which are caused by magnesium and certain of its compounds and provides a stable surface which can be readily coated or, if desired, used safely without a coating with the metal surface conforming to F&DA food regulations.

Producing metal for the container industry is a precise and demanding technical operation, requiring processes and methods that can be closely controlled and reproducible during the entire manufacturing procedure. This is especially true when considering the surface of the metal that must hold protective and decorative coatings.

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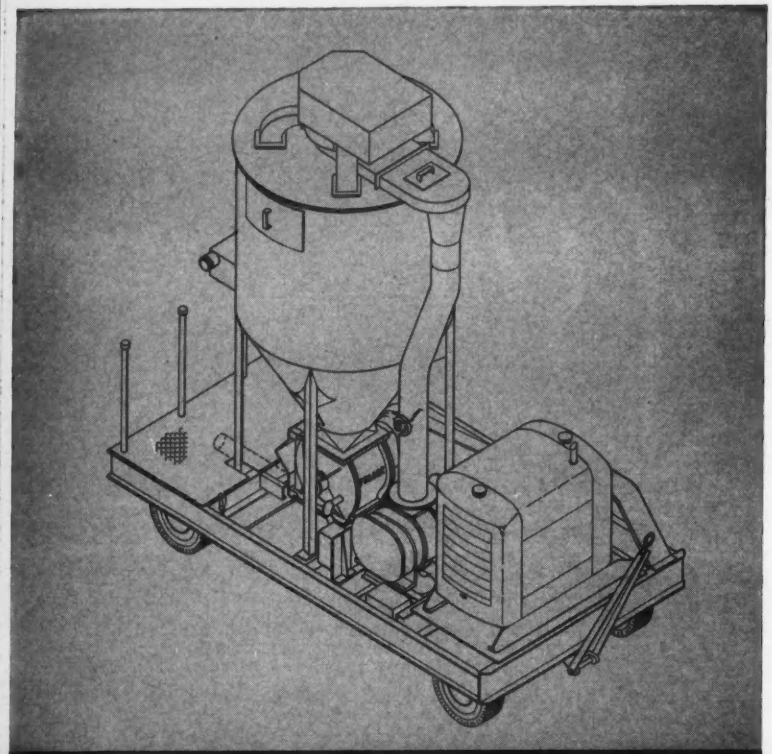

Safe, clean, jam-safe transfer of dusty chemicals, grains and flours is now possible with the advanced filter design of this new pneumatic transfer unit.

Newest FULLER portable transfer unit handles dusty materials

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Principal design feature of the new high capacity transfer unit is a newly developed, completely automatic filter. This unit is of extremely simple construction, its filter elements being cleaned continuously by a single master valve driven by a ⅛ hp. motor. The valve has only one moving part, the rotor, which is carried in two bearings, sealed for life.

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PRODUCTS AND PACKAGES

Duffy-Mott solves a weighty problem . . .

. . . for some 34 million overweight Americans who love to eat but hate to diet with a full-blown new line of 58 different low-calorie foods. Including such classic tempters as chicken cacciatore, meat balls and spaghetti sauce and tuna newburg, the line averages only about one-third the calories of conventional food.

Also included are fruit drinks and soups, dressings, gravies and sauces, fruits and desserts, jellies, preserves and sweeteners.

To date, the line of Mott's "Figure Control Foods" has been introduced in Boston, Hartford, New York, Philadelphia, Cleveland, Detroit and Miami.

Throughout the line, the company emphasizes, processing techniques have been employed that retain the food taste of regular foods; only the calorie-count has been changed!

five vegetable combinations

. . . three vegetables with sauces

New Line of Birds Eye frozen foods

. . . has been launched by General Foods in the New York and New England areas following three yr of study and development — including consumer testing of a total of 48 combinations or sauce items.

The eight new frozen vegetable products — described as the first in a long list of new products — include five combinations, and three vegetables with sauce. All are described as providing "unique taste characteristics not duplicated in the frozen or canned vegetable field."

Combinations are: green peas and pearl onions, green peas with sauteed mushrooms, corn and peas with tomatoes, green peas and celery and fordhook lima beans with tomatoes. Vegetables with sauce include: mixed vegetables with onion sauce, green peas with cream sauce and fordhook lima beans with cheese sauce.

The vegetable combinations, retailing for 29 to 39 cents, will be available in 10-oz sizes; the vegetables with sauce, for 29 cents, in eight-oz packages. Each package provides three-to-four servings.

Canned holiday cheer

. . . provides 46 oz of eggnog made according to a patented formula with a flavor that reportedly cannot be distinguished from fresh eggnog. Since the item is canned, it is completely sterile — therefore when opened will outlast bottled versions.

This is one of the new-product developments of Nodaway Valley Foods, Inc., Corning, Iowa — a subsidiary of Universal Food Products, Inc. of Lakeland, Fla.

Patented heat sealing technique produces up to 150 units per minute — slashes costs by as much as 20%

Now, with Hayssen's new PAC-FORM machines you can set up and heat seal poly coated, vinyl coated and spot coated carton or tray materials at speeds up to 150 units per minute — and save on initial purchase costs, labor requirements and material costs. The new PAC-FORM machines let you drastically improve package design and appearance while eliminating slots, cuts or locks that become disengaged or weaken side walls.

PAC-FORM machines are available for high speed, intermediate speed and hand fed operations using a broad variety of heat seal or glue seal carton or tray sizes.

Investigate the time and money saving features of the new PAC-FORM machines. Check in the yellow pages for your local distributor or write for descriptive literature.

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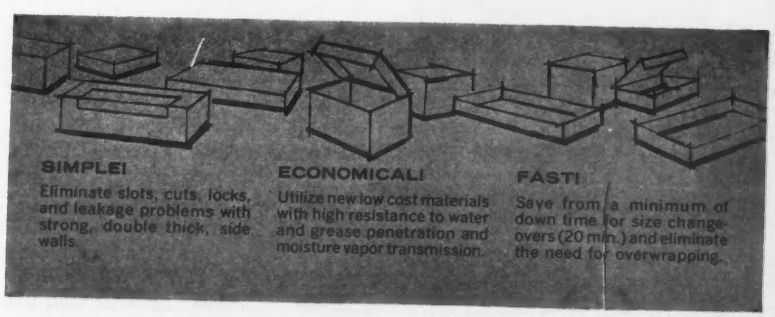
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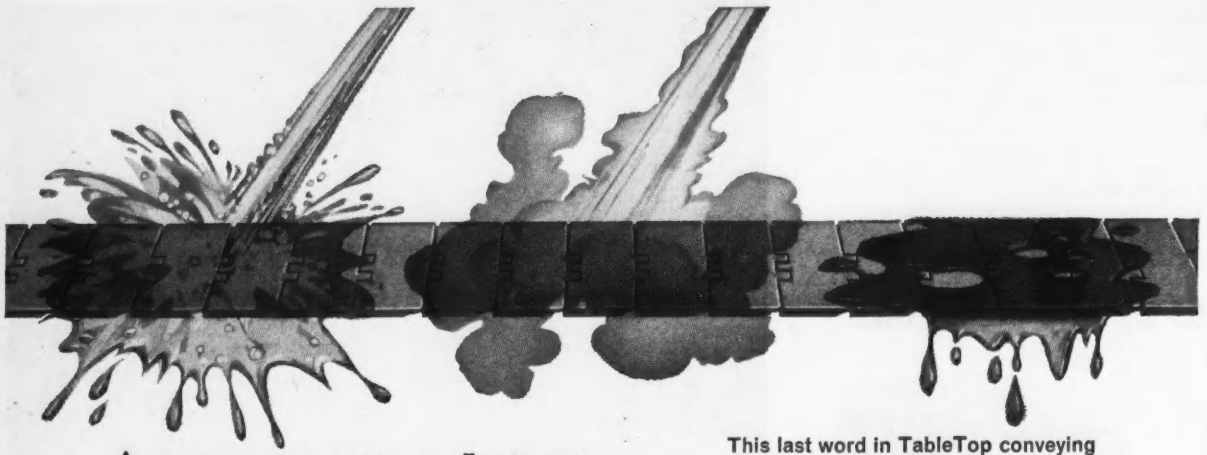

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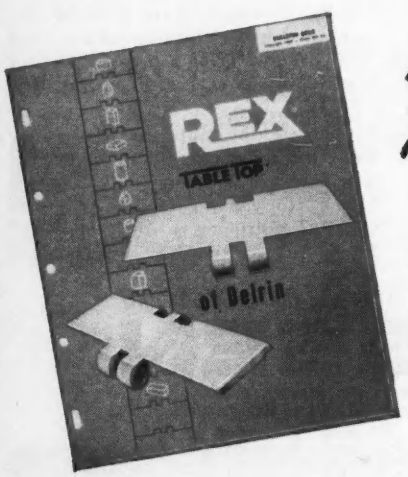

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conventions and exhibits

Jan. 19-20. National Preservers Assn., annual meeting, Galt Ocean Mile Hotel, Fort Lauderdale, Fla.

Jan. 21-24. National Canners Assn., annual meeting, including concurrent Canning Machinery & Supplies Assn. exhibit, Americana Hotel, Bal Harbour, Miami Beach, Fla.

Jan. 22-25. Plant Engineering & Maintenance Show & Conference, Convention Hall, Philadelphia.

Feb. 4-7. National Dairy Council, 47th annual meeting, Bellevue-Stratford Hotel, Philadelphia.

Feb. 5-6. California Freezers Assn., 1962 Convention, Jack Tar Hotel, San Francisco.

Feb. 9-10. Institute of American Poultry Industries, 33rd Annual Fact Finding Conference, Municipal Auditorium, Kansas City, Mo.

Feb. 26-28. Sixth Joint Military-Industry Packaging & Materials Handling Symposium, sponsored by National Security Industrial Assn. in cooperation with Dept. of Defense, the military services and Dept. of Commerce, Sheraton-Park Hotel, Washington, D.C.

Mar. 4-7. National Assn. of Frozen Food Packers, 21st annual convention, Palmer House, Chicago.

Mar. 5-8. American Society of Bakery Engineers, annual meeting, Edgewater Beach Hotel, Chicago.

Mar. 9-10. Tenth Annual Food Technology Short Course (this year's subject — "Nutrition in the Food Industry"), offered by Univ. of Missouri in cooperation with St. Louis and Kansas City IFT sections, University of Missouri, Columbia.

Apr. 24-26. Research & Development Associates, 16th annual meeting, Pick-Congress Hotel, Chicago.

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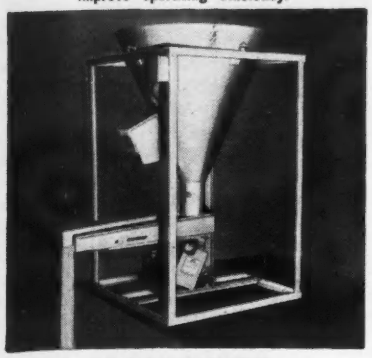

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10 NEW PRODUCTS IN THE LAST 5 YEARS

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food regulations

High court gives U.S. new foothold in intrastate food commerce

Supreme Court refuses to review N.Y. appeals court decision that out-of-state origin of ingredients puts FDA in the act

The U.S. Supreme Court has, in effect, upheld the government's jurisdiction over products made and sold wholly within one state, but produced from components shipped in interstate commerce. The court refused to review the federal seizure of misbranded cooking oil sold in New York but mixed from oils brought from other points.

Initially, the government lost its case against the product, labeled as containing "25 percent pure olive oil" but actually containing little or no olive oil. Federal District Court at Syracuse had ruled that the blended product was a new product and not the same as the component oil shipped in interstate commerce. Thus, the court had ruled, there was no federal jurisdiction since the product was made and sold wholly within one state.

FDA appealed to the Circuit Court of Appeals at New York City which reversed the lower court. The Supreme Court's denial of review allows the appellate decision in favor of FDA to stand.

First court penalty handed out on pesticide residue

The first criminal penalty against a violator of safe tolerance limits for a pesticide on fresh produce has been handed down against Jack and Johnny Sakioka, partners in Sakioka Farms, Culver City, Calif. The large growers and shippers of fresh vegetables were fined $602 for shipping celery containing parathion in violation of tolerance.

The Sakiokas pleaded "no contest" in Federal District Court at Los Angeles. The only previous criminal actions under the pesticide amendment were prosecutions several years ago involving excessive residues of a mold-prevention agent on seed corn later sold as chicken feed.

Armour sues to void new curb on ham moisture

"Watered ham" is again back amid the fires of controversy.

Armour & Co. filed suit in Federal District Court Nov. 6 seeking to void Agriculture Secretary Orville Freeman's order prohibiting added moisture in Federally-inspected hams. The suit, which describes the secretary's action as "arbitrary and capricious," also sought to stay the order, slated to take effect Nov. 17, until decision is made on the order itself.

The court refused to stay the order but also denied the government's motion for a summary judgment against the suit. This means that the regulation will be in force pending settlement of Armour's suit against the USDA.

The Armour action rekindles the flames under a controversy that has plagued

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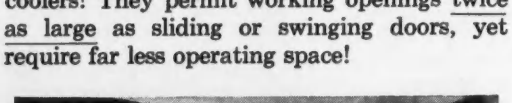

Spacesaving, standard COOLERdoors provide the performance-tested flexibility of custom-insulated (styrofoam or polyurethane) Weather-King Flush sections—to maintain 34° to 38° F temperatures.

Special fiberglas sections resist scuffing, bumping . . . impervious to moisture, easy to clean. Optional section facings of 26 ga. galvanized or stainless steel available.

Barber-Colman's exclusive, fully gasketed Cam Action insures outstanding airtight seal—zero (0) air leakage at 45 mph wind velocity (and test rated up to 122 mph wind velocity)—yet allows smooth, quiet opening and closing without binding or sticking.

Custom-designed, sold and serviced by Barber-Colman . . . manufacturers of highest quality overhead door equipment for controlled temperatures and relative humidity conditions—for over 30 years. Complete choice of manual or electric operation.

Your Barber-Colman door specialist (see yellow or white pages) is specially trained to help you plan for space-controlled savings in new and existing dairy and food processing plants. Phone him today, or write.

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food regulations

Freeman's administration of USDA ever since he took over. The trouble started when then Agriculture Secretary Ezra Benson amended the Federal meat inspection regulations to permit Federally-inspected hams to contain up to 10% added moisture. Meats affected included smoked hams, pork shoulders, pork shoulder picnics, and pork shoulder butts. Products labeled "cooked" weren't affected.

This action had long been sought by the big meat packers to put them on an equal competitive footing with local packers who operate within only one state, thus being unaffected by federal inspection. The local packers have been adding moisture to their hams for a long time and the resulting flavor and nutritional value had been giving them a sales advantage over the Federally-inspected packers. The big packers had been prohibited by USDA from adding any moisture whatever.

The Benson order of Dec. 30, 1960, equalized competition by allowing Federally-inspected ham too to add moisture — up to 10% of the original weight of the meat.

But consumer groups immediately attacked the order as "permitting adulteration" of ham and forced in-coming Agriculture Secretary Freeman to hold a series of public hearings on the question. These were held last spring.

In September Secretary Freeman announced that the Benson order of Dec. 30, 1960, would be voided as of Nov. 17, 1961, and that the old curbs against added moisture in Federally-inspected hams would again prevail, USDA said this action "is being made in the interests of consumers whose opinions — as expressed at the 8 public hearings — showed a general objection to added moisture."

In its suit, Armour charges that Secretary Freeman had expressed prejudice against addition of moisture even before the hearings were held, that the decision was made before the hearing officer had reported his findings and conclusions, and that the decision was against the counsel of the

committee Freeman himself has appointed to advise him on the problem.

Said Armour President William Prince, "The proposed change in the existing (since Dec. 30, 1960) ham regulation places a premium on *not* being subject to Federal inspection by the Meat Inspection Division — a sort of porcine Gresham's Law — "Bad hams driving out good ham!" It can result only in a steady flight from Federal inspection, hardly an understandable objective."

At presstime, neither USDA nor the Justice Department had made any comment on the suit.

Armour is continuing to process "watered" ham at 64 plants for intrastate distribution only.

One found guilty in new Cal-Tex perjury trial

The president of Cal-Tex Juices, Inc., has been found guilty of perjury in the recent orange juice water trial and fined $1,000. Gordon Van Liew, another company officer, also was handed a 10-year suspended prison term for committing perjury in the earlier trial, but was found not guilty of conspiracy to commit perjury. He and two other Cal-Tex officers and an officer of a related firm had been charged with perjury and conspiracy to commit perjury. The others were acquitted of both counts.

Earlier the three Cal-Tex officers and the president of a related trucking firm were fined a total of over $20,000 for adding water and sugar to an orange juice product. Gordon Van Liew was sentenced to six months in prison, the others received suspended sentences.

Hearings on deceptive packaging concluded

Hearings that may be the final act in the Senate inquiry into packaging and labeling get underway the middle of

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For samples and more information on the various types and viscosities of *Myvacet Distilled Acetylated Monoglycerides* available, write *Distillation Products Industries,* Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

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Suggested applications for *Myvacet Distilled Acetylated Monoglycerides*

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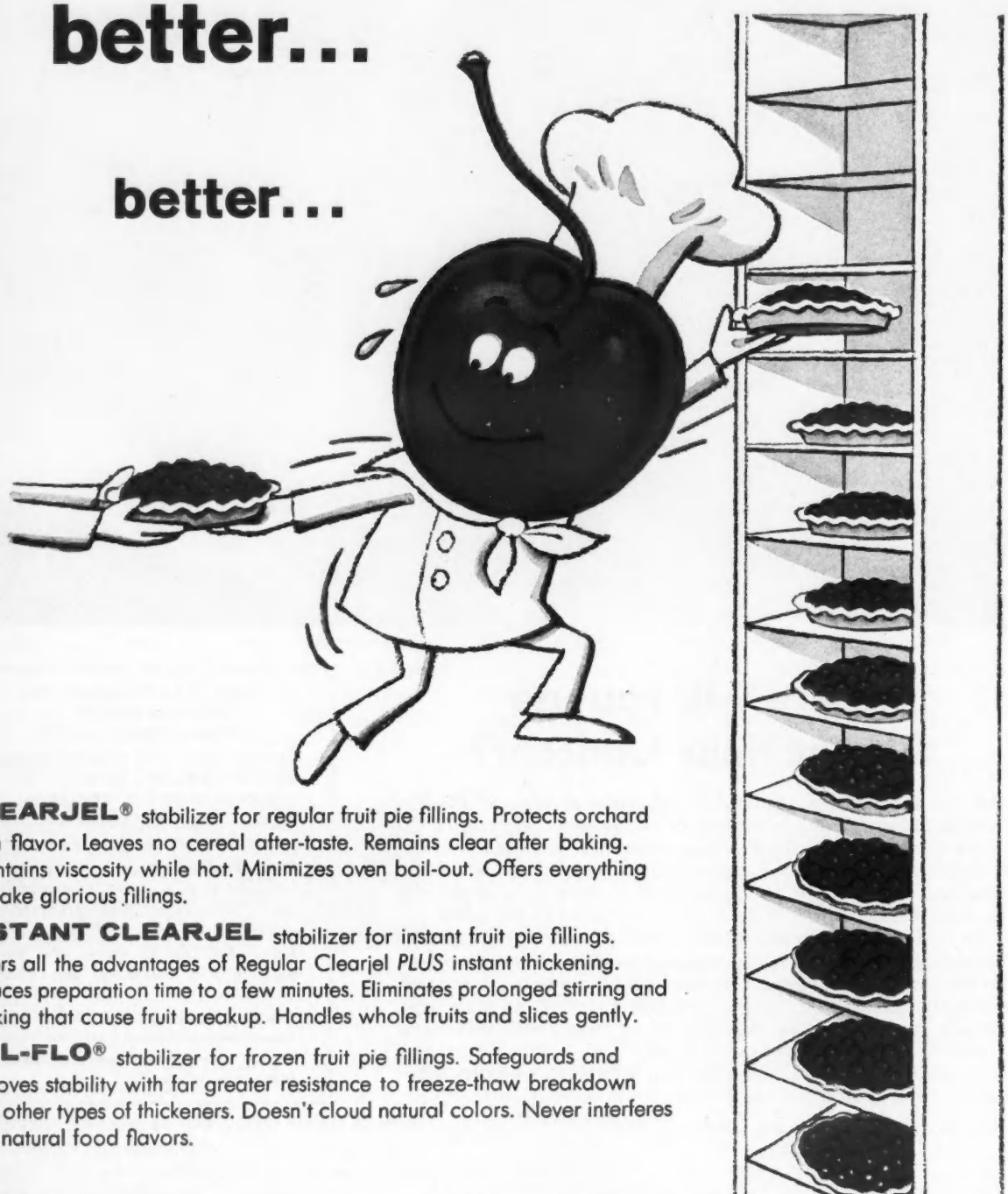

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this month. Sen. Estes Kefauver (Dem., Tenn.), chairman of the subcommittee on antitrust and monopoly, has yet to announce whether a sort of "postlude" hearing discussed for January or February actually will be held.

However, indications are that this month's hearings will conclude the inquiry. Kefauver's lieutenant in charge of packaging and labeling, Sen. Philip A. Hart (Dem., Mich.), may call 1962 hearings. If held at all, they would most likely be in the nature of a polite gesture to witnesses not selected to appear at the so-called "working sessions."

At the conclusion of this month's session, the subcommittee will have heard from all significant groups concerned with packaging and labeling of foods and other consumer products.

The next step is to draft legislation. Historically, committees headed by Kefauver have recommended legislation as a result of hearings. The committee bill probably will deal with a wide, general area rather than attempt to make line-by-line amendments to existing statutes.

Kefauver may drop his own favorite plan, a cabinet level Department of Consumers. Instead, he may support the more politically practical plan proposed by Sen. Hart: a presidential consumer adviser.

Kefauver seems genuinely impressed by packagers' obvious new awareness of consumer complaints. He has indicated that if this awareness appears headed for translation into action, he would not now recommend detailed packaging and labeling legislation.

FDA budget cut means fewer plant inspections

FDA is cutting back its plans for expanding some of its programs in the wake of President Kennedy's government economy announcement. The agency loses over $1 million under the new budget limit set by Secretary of Health, Education, and Wel-

fare Abraham A. Ribicoff.

Among the programs to be cut will be the expanded plant inspection program that FDA had expected to institute.

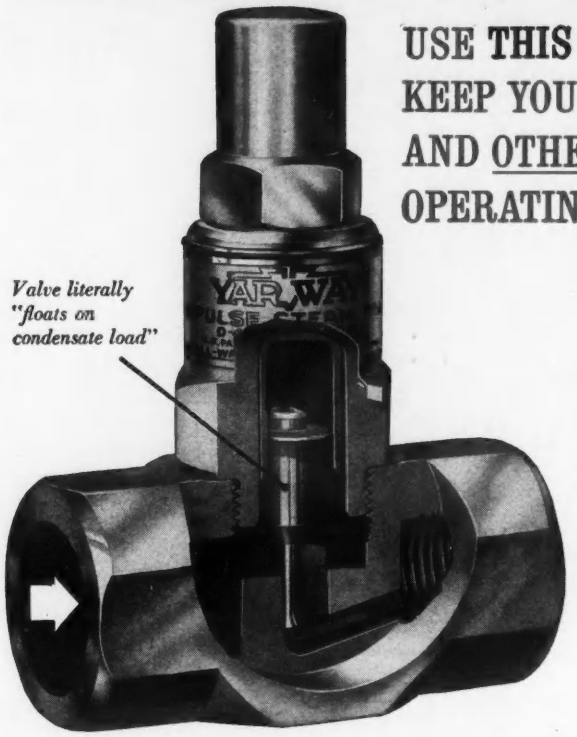
Health, Education, and Welfare was the first agency to announce major cuts — or impoundment of appropriated funds — as a move to decrease the national deficit, now expected to hit around $7 billion. Biggest cuts were in the Public Health Service's National Institute of Health, which has received from Congress funds far in excess of what researchers said they could properly use, and in Office of Education, which had received money to staff a new school aid program that failed elsewhere in Congress.

FDA's budget reduction was $1,146,000. Originally, the House of Representatives enacted a $23,580,000 FDA budget for fiscal year 1962, authorizing a total of 2,500 positions. Following the dispute between FDA and legislators over designating turpentine as a hazardous substance under the new labeling regulations, Congress reduced the FDA budget to $23 million, and 2,470 jobs. Even under that reduction, FDA could have added 271 new employees over last year in order to implement plans to expand existing programs and fully staff a hazardous labeling enforcement program.

The Kennedy-Ribicoff reduction leaves FDA with $21,854,000, and but 213 new positions. At press time, FDA was not sure exactly where it would retrench. The "upstairs office" at HEW is exercising its right to have a hand in the allocations.

However, FDA does know that the budget cut will mean somewhat fewer plant inspections and fewer samples collected for analysis. The agency had hoped to decrease by nearly one-third the time between plant inspections and to increase considerably its sample collection program. Whether these programs will actually fall below their recent levels, or just not increase according to plan, has not yet been determined.

YARWAY news briefs



Valve literally "floats on condensate load"

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Yarway Series 60 Impulse Steam Traps are the traps "designed with high production in mind." They get processing equipment hotter, sooner—and keep it hot. Here's how:

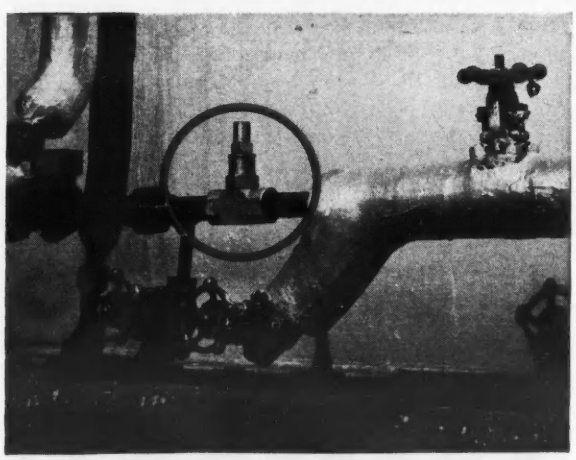
The only moving part, a small stainless steel valve, literally "floats on the condensate load." When equipment is started up, and condensate load is heavy, it opens wide and discharges at full capacity to bring equipment to operating temperature as quickly as possible.

In operation, it continuously senses condensate temperature, discharging each bit of condensate as it forms instead of storing up a bucketful. Result—higher temperatures, more even temperatures, more productive equipment.

Other Yarway features—small size, light weight, good for all pressures, low maintenance, stainless steel.

Yarway pioneered the impulse trap with its unique thermo-dynamic principle over 25 years ago. Most users find among Yarway's full line of impulse traps the profitable and productive solution to their steam trapping problems—you can too!

You can get Yarway's latest steam trap Bulletin T-1743, or a 90-day trial of any Yarway Steam Trap, by writing Yarnall-Waring Company or contacting your local Industrial Distributor.



¾" Yarway Impulse Steam Trap draining tank coils on sulfur storage tank, 175 lbs. pressure

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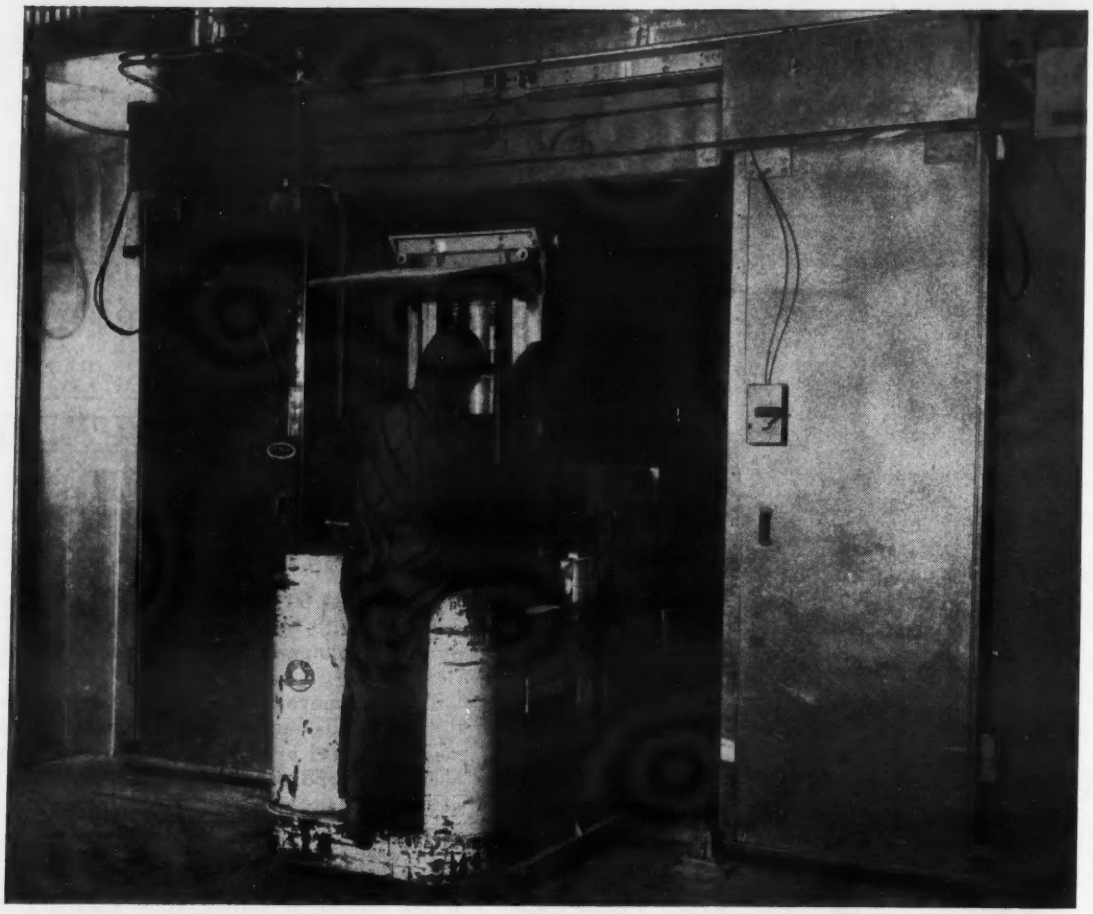

SMOOTHER TRAFFIC FLOW through high volume doorway with fast, automatic operation of Electroglide power door.

Jamison *ELECTROGLIDE*® Power Doors speed traffic in busy new food warehouse

SENSITIVE SAFETY EDGE. Electroglide has full travel and full height safety. Doors reverse immediately to open position when safety edge contacts person or object.

In their new warehouse at King of Prussia, Pa., Thriftway Foods installed two Jamison Electroglide power-operated doors to protect the entrances to the 8000 sq. ft. frozen food storage room. These automatic doors are handling high volume in and out traffic with these additional advantages:

rapid, convenient opening
smoother operation
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positive sealing
low cost operation

Send for the latest Electroglide Bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

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STANDARDS OF IDENTITY

Proposals

Mozzarella, pizza cheese — Stella Cheese Co. objects to standards proposed by FDA, writing to FDA that "to deny the use of this traditional name (Mozzarella) to this cheese that has so long been manufactured and merchandised under this title is a miscarriage of justice and a failure on the part of FDA to promote honesty and fair dealing in the interest of the consumer. . ." Stella suggests that Eastern type cheese could be called "high moisture Mozzarella," "soft Mozzarella" or "Mozzarella" and that Midwestern cheese could be called "low moisture Mozzarella" or "firm Mozzarella." Borden, meanwhile, has asked for new public hearings on the proposed standard. But the Italian Fresh Cheese Manufacturers Assn. opposes any new hearings.

Fish flour standard proposal attacked by Sen. Frank Carlson (R., Kan.) as "concerted effort to obtain legal sanction for the sale to the American people of an adulterated food product made from filthy and putrid substances." American Bakers Assn., Los Angeles Health Department, New Orleans Board of Health and others have also objected. A Washington State University professor has favored the proposal, as has the Council on Aging. The council suggests that only small whole fish be used in making whole fish flour.

Bread standard amendment proposal to permit optional use of L-cysteine offered by Foremost Dairies and Hy-Klas Food Products. Proposed limit would be 0.009 parts of L-cysteine for each 100 parts of flour by weight.

DIRECT ADDITIVES

Final Actions

Ethion tolerances, requested by FMC Corp.'s Niagara division, approved (Federal Register Oct. 21). Tolerances are 5 p.p.m. in or on almond hulls, 1 p.p.m. in or on eggplants, peppers and pimentos, and 0.1 p.p.m. in or on almonds.

Polysorbate 80 has been cleared (Federal Register Oct 20) for use as a surfactant in the production of coarse crystal sodium chloride. Clearance was sought by Diamond Crystal Salt Co.

Diatomaceous earth granted exemption from tolerance requirement (Federal Register Nov. 1) when used on stored barley, buckwheat, corn, oats, rye, sorghum (milo), and wheat. Phoenix Gems,

Inc., asked for the exemption.

Potassium iodide has been cleared (Federal Register Nov. 3) "as a nutritional supplement in mineral and vitamin-mineral preparations marketed under labeling which provides that the maximum daily intake of the additive does not exceed 0.15 mg. of iodine." Encapsulations, Inc., asked for the clearance.

Pending

Guthion — Chemagro seeks clearance (Federal Register Oct. 19) for a tolerance of 2 p.p.m. for residues of Guthion (0,0-dimenthyl S-4-oxo-1, 2, 3-benzotriazin-3 (4H)-ylmethyl phosphorodithioate) in or on artichokes, beans (green), blueberries, cranberries, currants, filberts, spinach, and tomatoes.

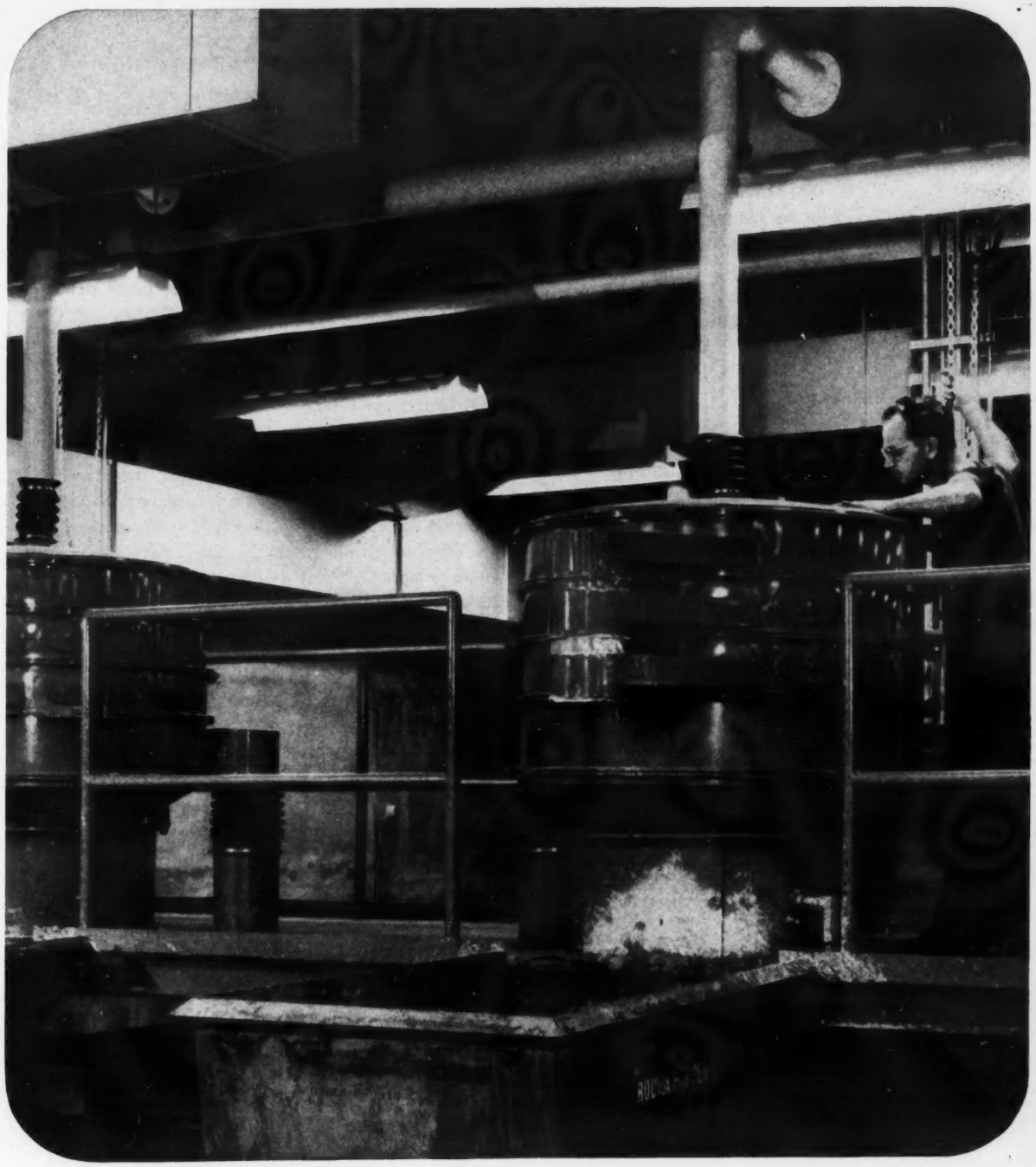
Dalapon — Dow seeks clearance (Federal Register Oct. 21) for tolerance of 2 p.p.m. for residues of Dalapon (sodium 2,2-dichloropropionate) in or on coffee.

Chewing gum — National Assn. of Chewing Gum Manufacturers seeks changes in the additive order for chewing gum components. The association says that the word "Perilla" should be changed to "Perillo" under the natural gums listing, that the description of genus and species of the family Leche de vaca be changed to "Brosimum utile (H.B.K.) Pittier and Poulsenis spp.; also Lacmellea Standleyi (Woodson) Monachina (Apocynaceae)," that "Isobutylene-isoprene copolymer butyl rubber" under the "other ingredients" listing be changed to read "Isobutylene-isoprene copolymer (butyl rubber)."

Meanwhile, James B. Rothschild (identifying himself as a consumer) has written to FDA challenging the blanket Food Additive Order for chewing gum base components, charging that the order "appears to be intended to establish by indirection a sort of definition and standard of identity for a food additive or a mixture of food additives." The chewing gum additive order cleared 29 components for "chewing gum base."

Asparagus — Clearance has been granted (Federal Register Oct. 31) for 10 p.p.m. of Sevin pesticide tolerance in or on asparagus. Union Carbide requested the tolerance for 1-naphthyl N-methylcarbamate.

Feeds — Animal Health Institute has asked FDA to defer for an indefinite period of time its proposed amendments which would set identical maximum-minimum levels for antibiotics in feeds.



Carling Brewing solves unusual waste screening problem

Up to 1,000,000 beer bottles a day are returned to the new plant of Carling Brewing Co. in Baltimore, Md. for complete cleaning prior to reuse. To remove the old labels and other foreign matter, the bottles are put through a caustic soda solution. By screening out waste sludge, the solution is 98% recovered for reuse. Two multiple-deck SWECO Vibro-Energy Separators automatically screen the waste solution at 75 gpm. They screen an entire day's waste in about four hours. Little supervision or physical contact with caustic soda are required. Thus costs are cut, danger of burns minimized. For full details, or free screening demonstration in *your* plant with *your* materials, write Department 294, SOUTHWESTERN ENGINEERING COMPANY, 4800 Santa Fe Ave., Los Angeles 58, Calif. SWECO

Vibro-Energy separators, wet grinding mills, finishing mills*

*TM SEC

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PURE VANILLA

It is probable that more money is spent in the food industry for vanilla extract than for any other flavoring ingredient. In the dairy industry vanilla ice cream alone accounts for 60% of all ice cream sales. Figures for the baking industry indicate that vanilla equals or exceeds all other flavorings in volume. Other food industries use comparable amounts.

Altogether, more than $10-million is spent annually for vanilla flavor. It would be a logical assumption that purchasers responsible for spending this huge sum should not easily be misled. Unfortunately there exists, even among some of the most experienced buyers, incredible misunderstanding and confusion about the variations in price among sources of supply, about prices from season to season and, in spite of the gyrations of the vanilla bean market, how some "pure" vanilla products can be offered at prices below reasonable cost of ingredients.

Many vanilla buyers have tried to apply reason to this perplexing, even chaotic, situation through careful development of specifications based on traditional analytical values: lead number, resins and vanillin. **But these three factors represent only one facet of this analytical approach** and can be disappointingly misleading. Some of the most experienced technicians frequently obtain widely varying analyses from the same extract!

Here is **the second facet** not to be overlooked in the determination of vanilla quality: there are many plant extractives and synthetic flavoring materials which can be used wholly, or in part, to produce the same analytical values, and to simulate the taste, of true vanilla. Fortunately this need no longer present a problem to the vanilla user who wants to be absolutely sure of what he is buying.

NOW there are methods which positively establish whether a vanilla flavor is a pure product made ONLY from vanilla beans.

These methods have been developed and perfected during six years of cooperative research financed at considerable cost, shared by the Vanilla Extract Manufacturers and the Vanilla Bean Association.

In addition to improved conventional analytical procedures, there are now such revolutionary techniques as paper chromatography, gas liquid chromatography, and other scientific methods. The above methods in whole or part will lead to standardized procedures for the analysis of pure vanillas.

There has always been, and always will be, a difference in pure vanilla extracts, because progressive manufacturers diligently work to maintain the highest standards in their purchases of raw materials, in storage of their vanilla beans, and in the processing and production of their extracts.

Vanilla users striving to produce the finest products to win a larger volume in today's competitive market can now learn more of the real value of the vanilla extracts offered them. In addition to investigating the integrity of their supplier, the newly developed methods of quality determination provide more positive assurance that the extracts they buy will have the full flavor profile of fine, pure vanilla.

Analytical proof may now be obtained from a number of qualified independent consulting laboratories.

KNOW YOUR VANILLA AND YOUR SUPPLIER

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Manufacturers of Certified Food Colors, Vanillas, Extracts, Flavors

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plants companies personalities

Rival Packing Co., Chicago, a division of Associated Products, Inc., has appointed **Erik E. Roos,** vice president of manufacturing. In addition to directing planning and manufacture of Rival dog food and related products, Roos also will be responsible for all research and product development activities. Previously, he had been an industry management consultant with George Fry & Associates, Chicago.

Roos

Cool

Mel Cool has been named manager of **Seymour Foods of Georgia, Inc.,** Gainesville, Ga. — a subsidiary of Seymour Foods, Inc., Topeka, Kans. Cool has been associated with the egg and poultry processing business for 33 yr — principally at Seymour's Concordia, Kans., plant.

E. W. Rawlings, executive vice president since April 1960, has been named president of **General Mills. C. H. Bell,** president since 1952, now is chairman of the board, succeeding Gerald S. Kennedy. The latter will continue as chairman of the executive committee of the board.

Robert Di Giorgio, executive vice president of Di Giorgio Fruit Corp., San Francisco, has been elected president of **S & W Fine Foods, Inc.,** San Francisco, a Di Giorgio wholly owned subsidiary. He succeeds Joseph Blumlein, who has severed a 28-yr affiliation with S & W.

Procter & Gamble Company soon will begin building a new food products plant in Jackson, Tenn. When operations begin in spring of 1963 (on possibly a cake mix product?) the plant will initially employ 50.

plants, companies, personalities

Southern Bakeries Co.

Atlanta, has purchased Cake Box Packaged Products, Inc., Kansas City, Mo. The newly acquired plant will be modernized and enlarged to supply Midwestern states with Southern's new line of frozen cakes, which is to be marketed nationally by a new frozen foods division, headed by Harold A. Greenberg as vice president and general manager.

Seabrook Farms Division

of Francis H. Leggett & Co., wholly owned subsidiary of Seeman Brothers, Inc., New York, has signed a sales and marketing agreement with N. Kilvert & Sons, Manchester, England, whereby the English company will exclusively distribute Seabrook Farms frozen products throughout the U.K.

General Mills

has named Patricia D. Cummisford a project leader in the Exploratory Food Research Department of the company's James Ford Bell Research Center, Minneapolis. Miss Cummisford has completed the requirements for the Ph.D. in food technology at University of Illinois.

Red Star Yeast & Products Co.

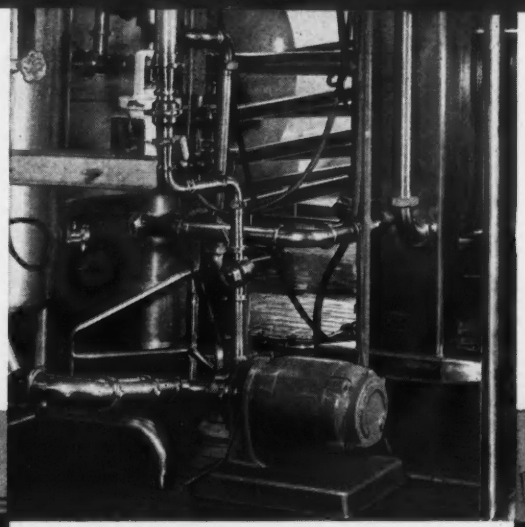
Milwaukee, has appointed Richard T. Fukuda, formerly with the food research division of Armour & Co., head of the cereal chemistry laboratory of the Yeast Division. Fukuda will supervise the control bake shop, and will conduct research in applied baking technology.

Chun King Corporation

has begun construction of a third plant, on a 13-acre site in Cambridge, Md. The new plant will equal in size Chun King's current plants in Duluth, Minn., and Jackson, Ohio.

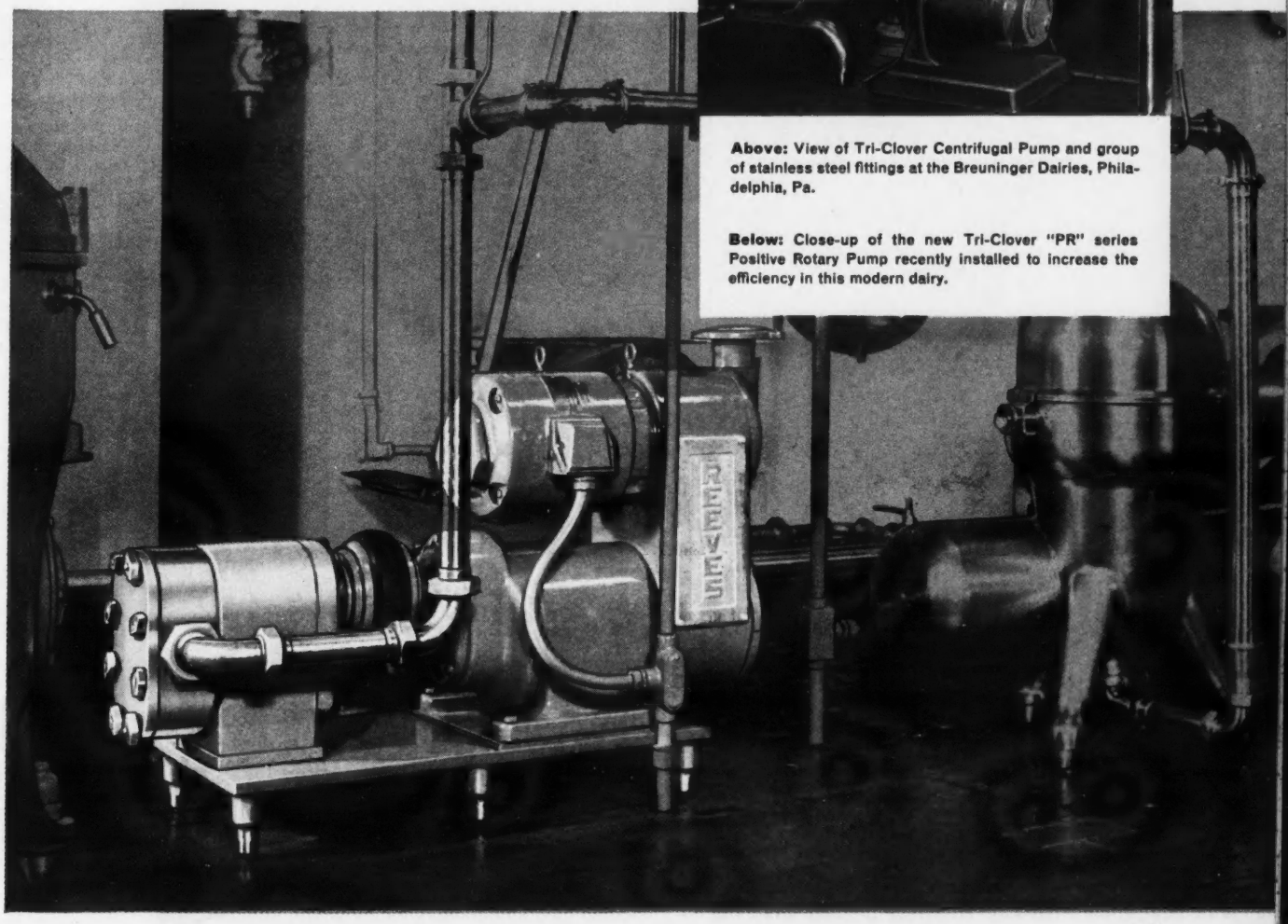
For more information on product at right, circle 6693 see information request blank opposite last page.

TRI-CLOVER SANITARY PUMPS and FITTINGS help maintain quality for BREUNINGER DAIRIES



Above: View of Tri-Clover Centrifugal Pump and group of stainless steel fittings at the Breuninger Dairies, Philadelphia, Pa.

Below: Close-up of the new Tri-Clover "PR" series Positive Rotary Pump recently installed to increase the efficiency in this modern dairy.



P-381

To help maintain high standards of quality in their milk processing operations, Breuninger Dairies of Philadelphia utilizes numerous Tri-Clover Division products, including Tri-Clamp and Bevel Seat stainless steel fittings, in addition to Tri-Clover Centrifugal and Positive Rotary Pumps. For this well-known dairy has found that Tri-Clover products embody highest quality materials and have long met the most exacting sanitary processing requirements.
Let Tri-Clover fittings and pumps help to achieve new standards of efficiency in *your* processing operations.
See your nearest Tri-Clover distributor.

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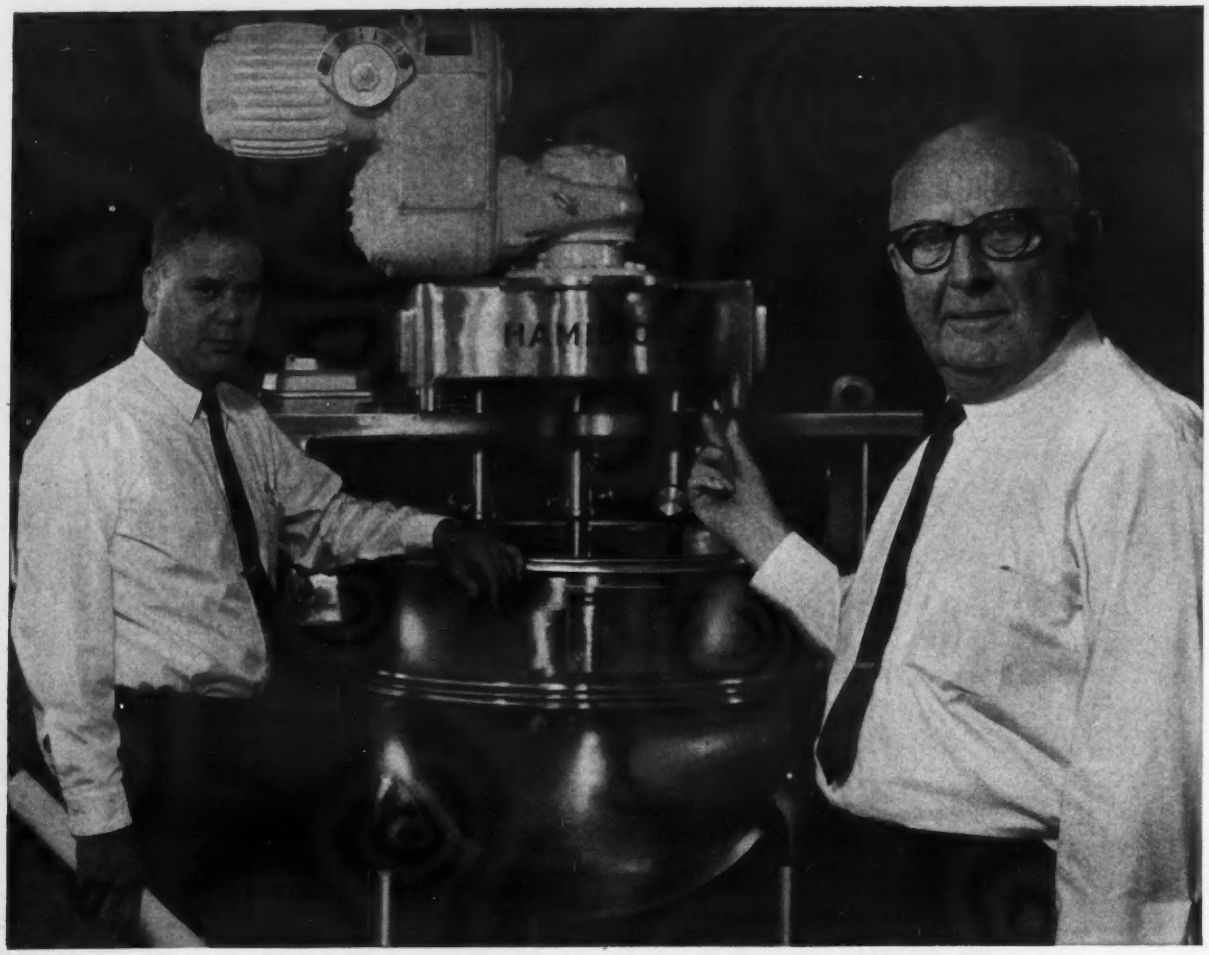
Cable TRICLO, CHICAGO



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New Bulletin No. TD-1 has all data, diagrams. Write to Dept. D-12.

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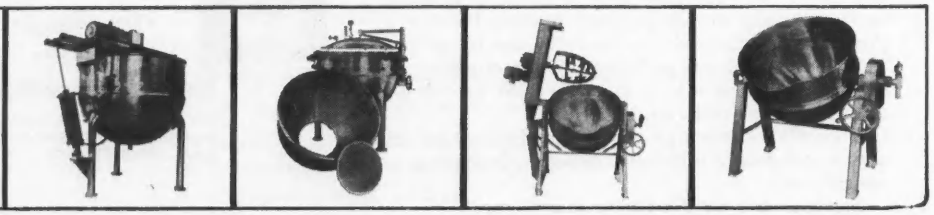
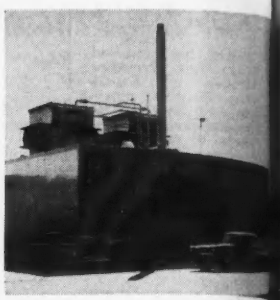


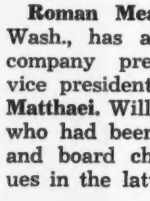
6694 on Reader Service Slip.

plants companies personalities

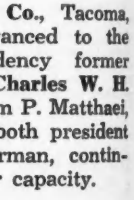


Pfaelzer Brothers, Chicago, pioneer purveyor to restaurants, hotels and institutions, has moved to a new meat fabricating plant at 4501 West District Blvd., in Chicago's southwest side Central Manufacturing District. The 79,000-sq-ft, one-story insulated aluminum-panel building reportedly accommodates the meat industry's most modern facilities for receiving, processing, fabricating, packaging and shipping.

Roman Meal Co., Tacoma, Wash., has advanced to the company presidency former vice president **Charles W. H. Matthaei.** William P. Matthaei, who had been both president and board chairman, continues in the latter capacity.



Schenk



Matthaei

Pet Milk Company, St. Louis, has established a new Frozen Foods operating division to take over production and marketing of the company's frozen food products which formerly were part of the Food Products Division. **Boyd F. Schenk,** formerly production manager, Frozen Foods, heads up the new division as general manager; production manager is **Clare E. Glandon,** promoted from district superintendent, frozen foods, production.

Robert E. Parker has been promoted from director of the Central Control Laboratory to quality control manager by **Western Condensing Co., Division of Foremost Dairies,** Appleton, Wis. He replaces Ara O. Call, who resigned to accept a missionary assignment with the Mormon church.

Quality Bakers of America Cooperative, Inc., New York, in filling the New York laboratory headship vacancy caused by the recent death of Dr. Oscar Skovholt, has appointed **Dr. Simon S. Jackel,** most recently director of research with Vico Products Company of Chicago. Previously he had been with Standard Brands' Fleischman Laboratories, Stamford, Conn. Dr. Jackel will supervise the association's quality product control program for its 137 member-bakeries.

Seeman Brothers, Inc.'s new $1 million frozen food processing plant and warehouse on Prince Edward Island, Canada, will process vegetables and other frozen foods for the Canadian market under the Seabrook Farms and Snow Crop labels, as well as under Canadian private labels. Located in the center of one of the best fishing areas in the world, the Prince Edward plant will be the pilot operation in Seeman Brothers' entree into the frozen prepared seafoods field.

More news of Plants, Companies and Personalities on pp. 58, 75, 89

Making case History

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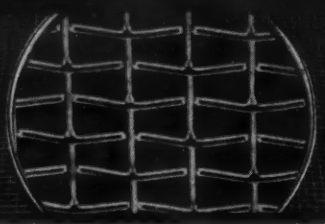
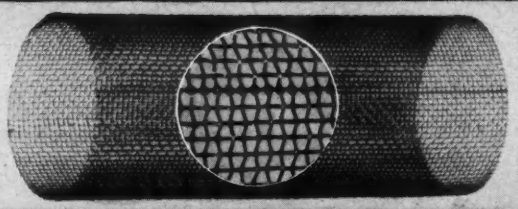


SEAMLESS



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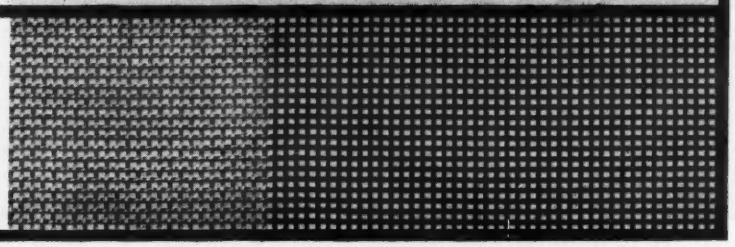

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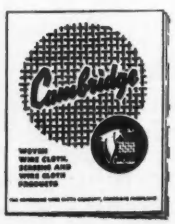

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association news

Canners' theme — 'consumer protection'

"The Canning Industry and Consumer Protection" will be the very timely theme of the National Canners Association's 1962 Canners Convention — to be held Jan. 21-24 at the Americana Hotel, Bal Harbour, Miami Beach, Fla.

At least two major research sessions will be devoted to examining aspects of this subject.

On Tuesday, Jan. 23, FDA Commissioner George P. Larrick will be featured speaker at a special Research Session. In speaking on FDA's responsibilities and activities in the consumer protection field, it is expected that he will give special attention to the subject of factory inspection.

Among other things, it is probable that Commissioner Larrick will discuss the scope of inspection authority, past and present, and proposals for the future.

On Wednesday, Jan. 24, the N.C.A. and the co-sponsoring Canning Machinery and Supplies Association (which also sponsors the concurrent four-day exhibit) will conduct a clinic session of "Fill Control and Filling Equipment."

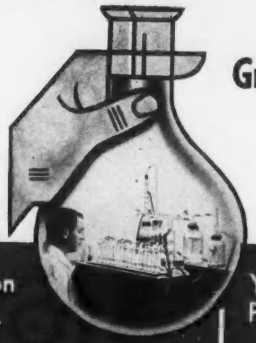
L. W. Beacham, assistant chief of the FDA's Food Division, will be on the panel to outline regulatory requirements and answer related questions.

Other panelists will be selected from the NCA Research Laboratory staffs, the machinery and supply industry and the canning industry — to cover aspects of continuous control of fill and mechanical filling operations.

Besides the Research sessions, the over-all meeting program also provides for sessions on Production, Marketing, Raw Products and Fisheries.

The CM&SA exhibit will run concurrently with the meetings — from 12 noon to 4 PM on January 21, and from 10 AM to 4 PM on the three succeeding days.

More Association News on p. 103



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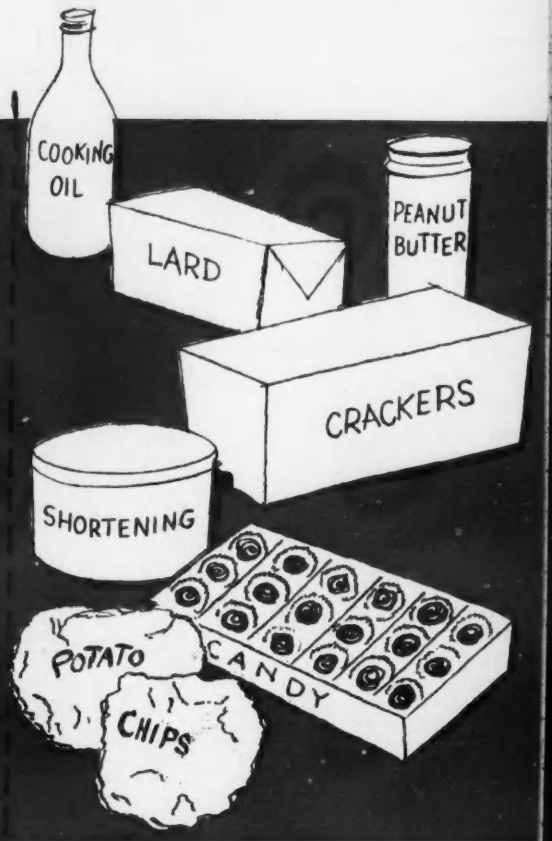

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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
DECEMBER 1961
VOL. 22 NO. 12

UNITED FRUIT

becoming a major producer of freeze-dried foods

United Fruit *and Food Corporation's freeze-drying operations are centered in this plant in San Carlos, Texas, formerly owned by Liana, Inc., with* 40,000 *cu ft of frozen storage space,* 50,000 *cu ft of dry storage space, and* 12,000 *sq ft devoted to processing, quality control and offices*

FP STAFF

INSIDE THE WHITE WALLS of a square concrete building in San Carlos, Texas, a quiet revolution is being prepared for the food industry.

A beach-head has already been established in this little town, hardly more than a cross-roads on Route 107, a dozen miles north of the Rio Grande and 50 miles northwest of Brownsville. Here, in one of the largest freeze-drying plants now in operation in this country (or anywhere in the world), United Fruit and Food Corporation is processing high quality shrimp, chicken, beefsteak, mushrooms, and choice vegetables such as asparagus for the institutional market — hotels, restaurants, and clubs.

From this base, the firm intends to launch a many-pronged campaign aimed at capturing a major share of the total market for these and other new "convenience" foods.

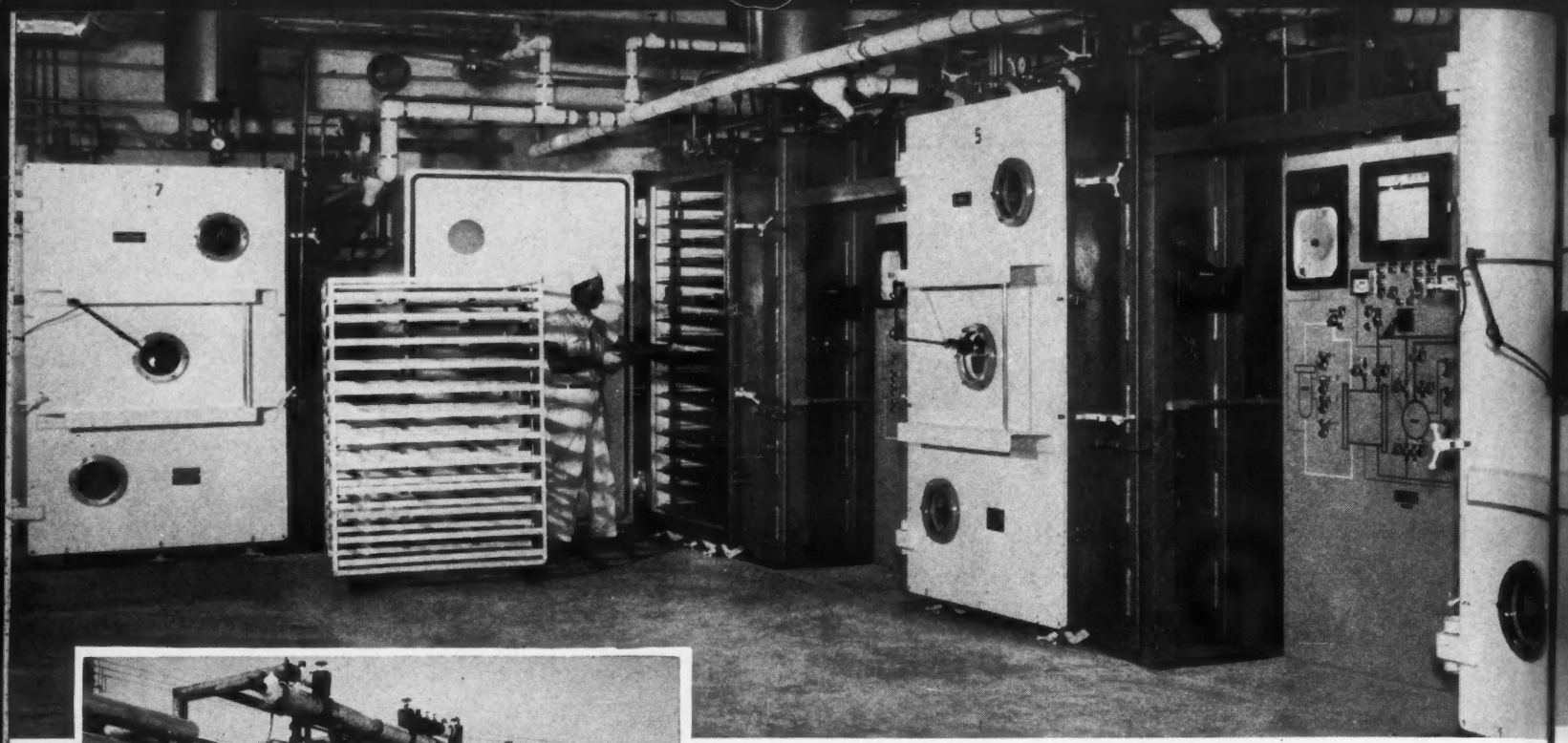
United Fruit and Food Corporation's vacuum freeze-drying operations represent the first major venture into food processing by its parent, United Fruit Company, the big Latin American fruit-growing and marketing organization.

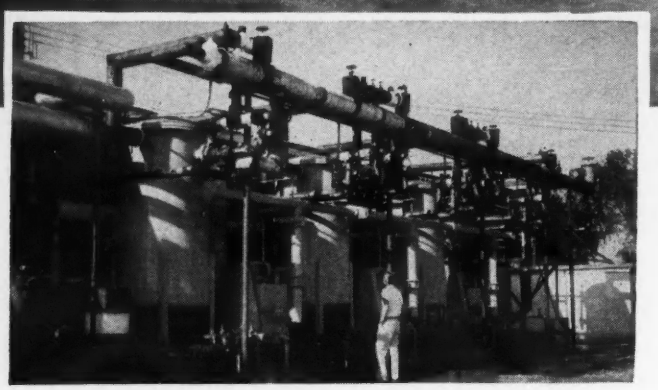
This bold step is part of a broad program of diversification mapped by Thomas E. Sunderland, President of the Boston-based company, to enlarge its traditional business in bananas and other fruits. Action followed swiftly once United Fruit decided to move into food processing.

To gain time, United Fruit bought the small freeze-drying business of Liana, Inc., in September 1960, and set about expanding and revamping Liana's plant in San Carlos. The modest-sized vacuum freeze-drying equipment which Liana had been operating since its founding in 1956 has now been supplemented by a large modern system designed to meet United Fruit's requirements and built by F. J. Stokes Corporation, Philadelphia.

Stokes was selected by United Fruit Company and its food processing subsidiary, United Fruit and Food Corporation, because Stokes had pioneered in developing the vacuum freeze-drying process in this country, and for the past 25 years has been working closely with food processors interested in utilizing this technique.

Cleaning, cooking, and packing operations at San Carlos have also been completely revamped and mechanized to a high degree. The search for efficiency has not been al-





Modern, *large-scale freeze-drying plant shown in these photos is a new addition installed last summer. Above — the four vacuum-drying chambers operate around the clock, seven days a week, are processing the equivalent of 10 tons of raw material per day.*

Inset *— the large plate condensers which trap the moisture removed from the shrimp, the vacuum pumps, the hot-oil circulating pumps, and other auxiliary machinery for the Stokes freeze-drying chambers are*

How freeze-dried

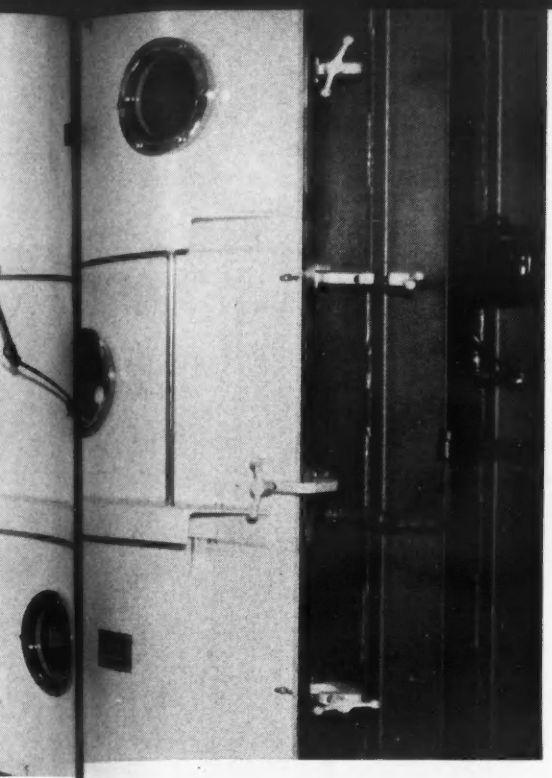
All-radiant heating system for freeze-dryers markedly reduces drying times

lowed to intrude upon the overriding objective of producing a consistently high quality product.

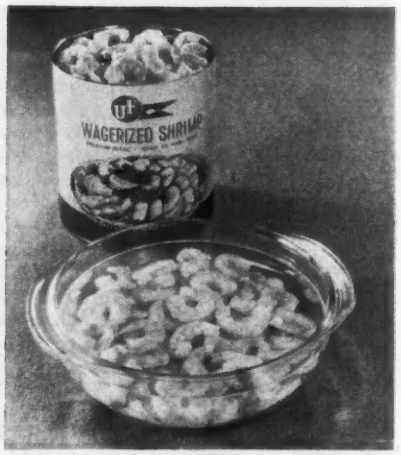
Laboratory tests of the incoming fresh or frozen food and the vacuum freeze-dried finished product are continuously being made, supplemented by inspections at numerous points along the processing line.

United Fruit, with its initial food processing operations now well launched, is looking ahead to expanding its operations, not only at San Carlos but elsewhere. The company anticipates adding, in the near future, the processing of high quality beef. Some of the beef may eventually come from United Fruit's own cattle and beef operations in Central America. Various dehydrated fruits and vegetables will in time be added to the line and maximum use will be made of tropical fruits from the countries in which United Fruit has fruit-purchasing or fruit-growing operations.

United Fruit's freeze-dried products are at present being sold mainly to institutional markets, some under the "U.F." label, some under private labels, through a network of food brokers. A considerable amount is going to "national" accounts, including the Army Quartermaster Corps, which is buying substantial amounts for our armed forces. United Fruit is also supplying freeze-dried component foods to other manufacturers. These outlets combine to keep the plant at San Carlos running around the clock, three shifts a day, seven days a week.



installed outside of the drying room — at the moment, on this unroofed platform at the rear of the San Carlos plant — where they can be serviced without interfering with the processing operations



***Foods** processed by vacuum freeze-drying require no refrigeration, store perfectly for long periods, and save on shipping costs because they weigh only a fraction of their original weight. They come to the kitchen virtually ready to serve, and reconstitute quickly (20 minutes) to the flavor, texture, and color of the fresh-like state by replacing the water that was removed in the freeze-drying process. Nutritional values are retained to a very high degree.*

For reconstitution, the contents of a #10 can are placed in 2½ quarts of lukewarm water containing 2 tablespoons of salt and ¼ cup (8 tablespoons) of lemon juice. For a blander rather than a fresh sea food flavor only 2 tablespoons of lemon juice and 1 tablespoon of salt are used. For those who like a highly seasonsed flavor, the water can be replaced with court-bouillon.

The shrimp are allowed to stand in the reconstitution liquid for 20 min, and are then drained and chilled in a covered container until ready to use.

***Wagerizing** is the name which United Fruit gives to the patented process it holds on freeze-drying shrimp. The patent, US 2,765,236, issued in 1956. Considerable improvements have been made in the process since that time — latest improvements described below*

shrimp are produced

IN PROCESSING shrimp — the largest volume food currently being freeze-dried at United Fruit's Texas plant — the quest for quality begins with the skipper of the boat. How much scrutiny he gives his catch as it is hauled aboard, how carefully he ices it in the hold, and how promptly he lands it at the wharf — all these factors affect the number of full-size, marketable shrimp contained in his boatload.

United Fruit's shrimp buyers — at Brownsville and Port Isabel, Texas, where the finest shrimp in the world are landed, from the Gulf of Mexico, and at other points — select and purchase the best from the available supply. Once landed, the shrimp are quick-frozen into 5-lb blocks and swiftly trucked to San Carlos.

Each boatload is segregated from the others in the refrigerated storage vaults, and from each load are checked for flavor, texture, and freshness in the quality control laboratory before that lot is accepted for processing. If the samples do not measure up to United Fruit's exacting standards of quality, that load is rejected.

Accepted shrimp are kept frozen until the preparation line is ready to process them, but this is seldom more than 24 hours.

Preparing the shrimp for vacuum freeze-drying involves grading the shrimp for size, batch-weighing, cooking, cooling, a second size-grading, peeling, deveining, inspection, a second batch-weighing, another grading for size and "wholeness," loading into special trays, and freezing.

Several of these operations have been mechanized — notably, the grading, batch-weighing, and cooking — and further mechanization has been developed for slicing through the shell and removing it from the shrimp. The deveining and cleaning, the inspection for "wholeness," and the loading onto trays, however, are best carried out by skilled hands.

Freezing before drying: The loaded trays of cleaned shrimp are moved into the freezer room on special multi-tiered trucks and held there for a minimum of four hours.

They are brought into the drying room on the same trucks when one of the drying chambers is ready to receive them, and quickly placed on the shelves of the vacuum chamber. The chamber is closed, rapidly evacuated to a very low pressure, and the vacuum freeze-drying process begins.

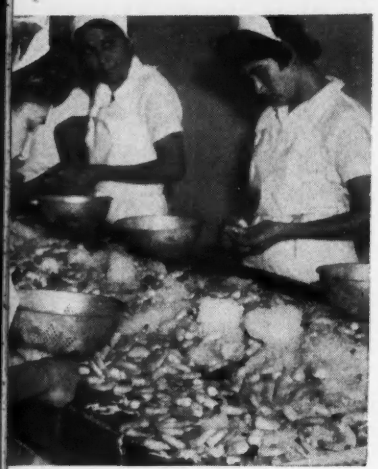
Radiant heat transfer: The trays of shrimp are suspended above the heating shelves for drying by Stokes precisely

UNITED FRUIT continued

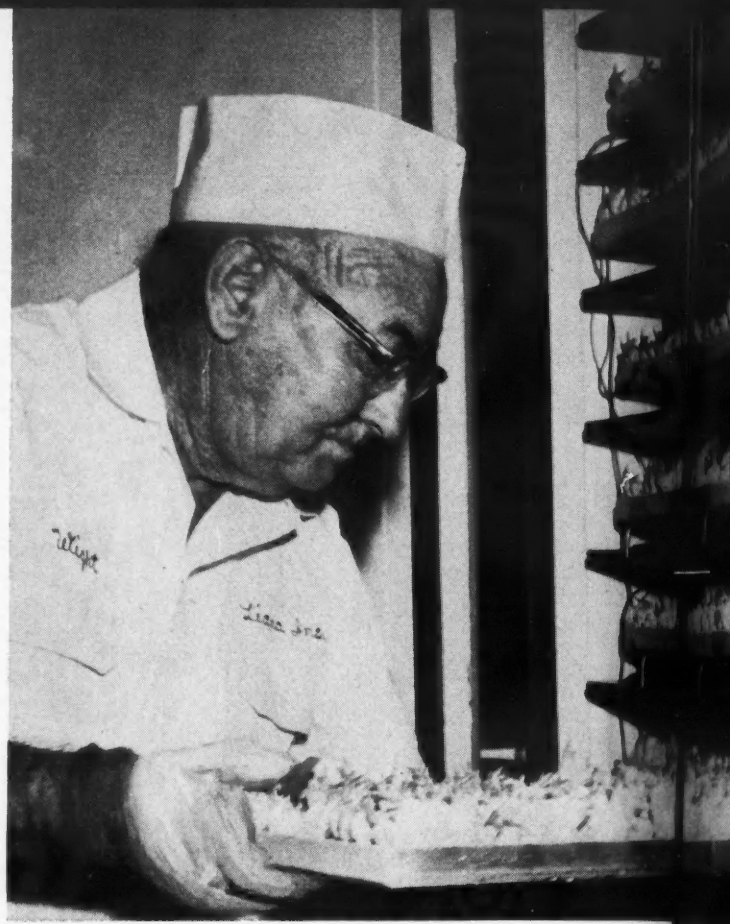
Into *a cooling bath of ice water go a batch of cooked shrimp. Previously the raw shrimp were graded to uniform size, and then carried, in individually weighed batches, through a cooking bath of boiling water. Speed of travel of the batch through the cooker is varied according to the size of the shrimp (as measured by the weight of the batch), to insure uniform tenderness in the finished product*

1.

2.



Cooked *shrimp after being mechanically graded into four sizes and again iced, are rapidly peeled, thoroughly cleaned and deveined by hand by a host of women, working in air-conditioned rooms at stainless steel tables with chlorinated wash water running in troughs down both sides. Each colander-load of cleaned and deveined shrimp is carefully inspected before it is accepted for freeze-drying. Each size is kept separate during subsequent processing. Consistent uniformity of size for profitable portion control at the point of consumption is a major selling point for United Fruit's freeze-dried*



4.

After trays *are loaded into drying chamber (see photo 7 p 30) operator pulls out tray to insert one of the thermocouples which are buried in the trays at several points, the wires being led to a junction permanently installed in the framework of the drying chamber (visible in photos 5 and 6) and thence to the thermographs on the control panel (photo 9). Note that the trays are suspended above the heating shelves in the chamber by means of wire supports, for uniform drying by radiation heating*

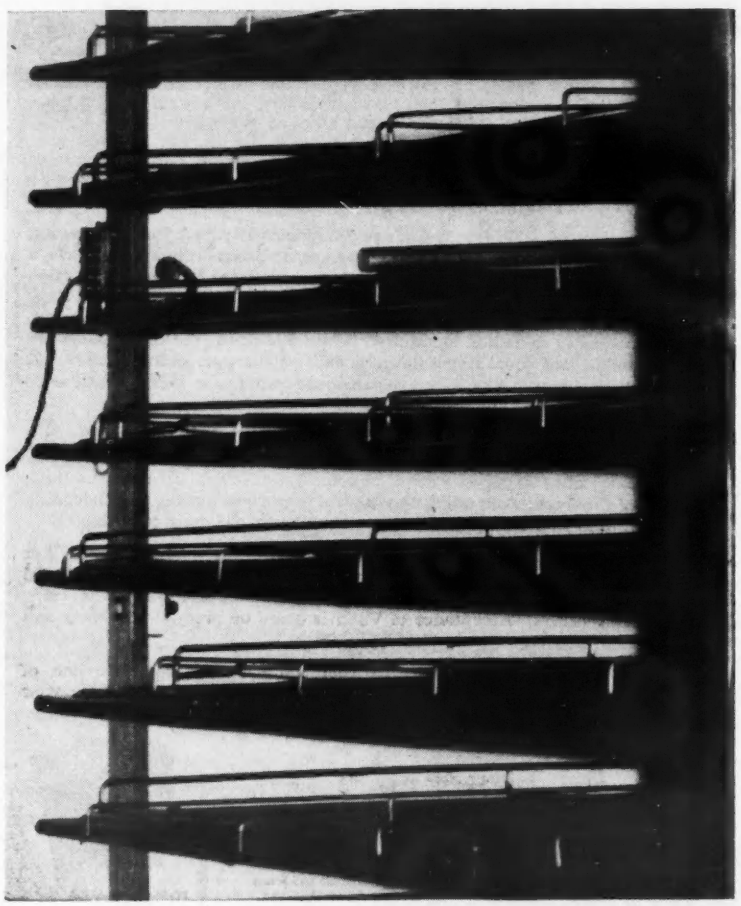
3.

The shrimp *are carefully loaded on perforated metal trays, side-by-side on their backs with their tails up. A final check before this loading operation insures that only whole shrimp are processed; fragments are disposed of elsewhere. The trays are then loaded onto a multi-tiered truck and wheeled into the blast freezer. The blast-freezing locks in the natural flavor and quality by forming ice crystals which (under vacuum conditions in the freeze dryer) sublime rapidly without destroying the cellular structure of the delicate flesh, thus preserving its appetizing texture*

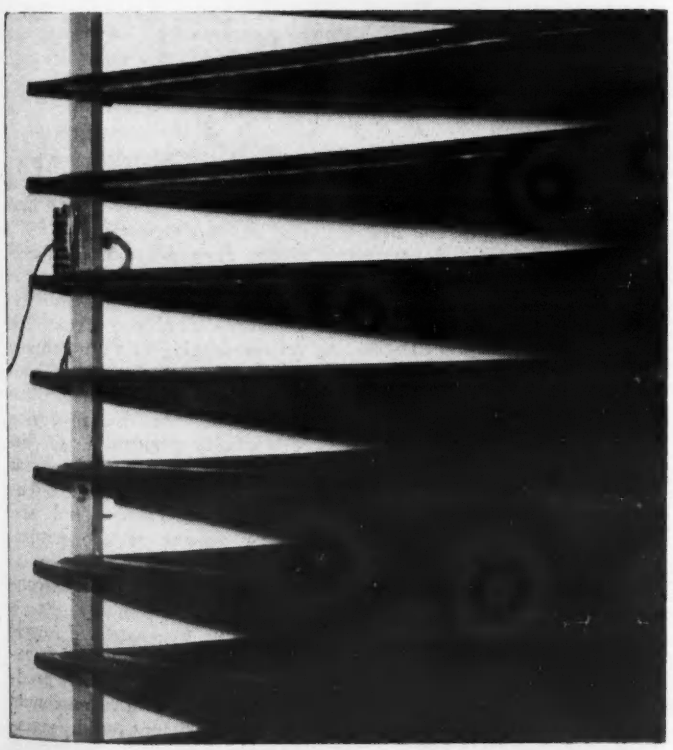
UNITED FRUIT *is not revealing freeze-drying details, but last month in our report on the Military-Industry Conference (Nov. FP, p 43) we reported that by use of radiant heating and high plate temperatures of 280 to 300 F during the first hour or so of drying a 10 hour drying cycle for cooked deveined shrimp is possible instead of the 20 hour cycle typical for the conventional process. The high plate temperature during the initial stages of drying accelerates the vaporization of water greatly and does not injure the quality of the food, which is not indirect contact with the plate. Drying cycles as short as four hours have been set up for diced meat pieces with all heat transfer being effected through radiation.*

Typical data on drying times for conventional conductive drying and Stokes radiant drying system for production operations are given below. The figures given are based on performance of production equipment now being used or being built. Shorter times which have been reported for freeze-drying with radiant heating are based on laboratory tests. Actual drying times depend on not only the design of the freeze-dryer, but also on tray loading density, plate temperature, and vacuum.

	Hours for drying cycle	
	Typical Conductive	Actual Radiant
Diced chicken	18	7-8
Diced beef	16-17	6½
Whole milk	22	10
Mushrooms	20	10
Cod steaks	18	8
Brussel sprouts	20	9



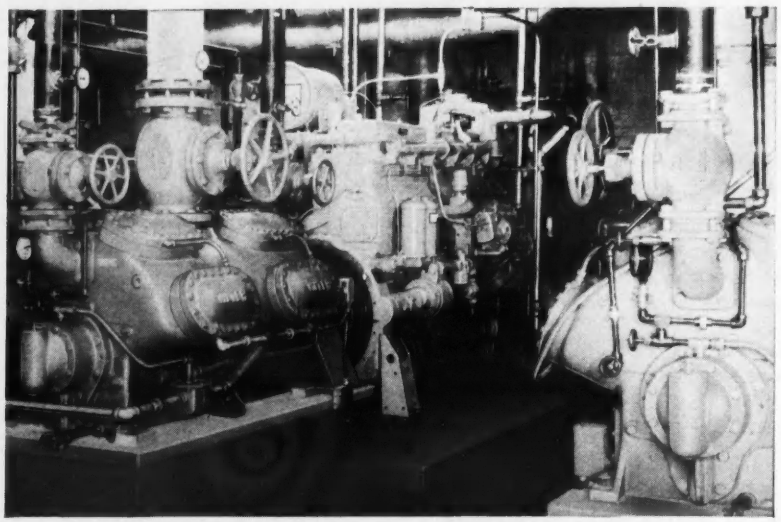
6. Cleaned shelves *with wire supports in place*



5.

The shelves *with the wire supports removed for vacuum cleaning*

Various Steps... VARIABLE CAPACITY



WILSON & CO. INC.

View showing the two 16-cylinder Vilter ammonia compressors, driven by Caterpillar natural gas engines, in Wilson & Co.'s Albert Lea, Minnesota, plant. These two new Vilter Units supply an additional 200 tons of refrigeration to the plant's existing 1800 tons.

The new Vilter Close Capacity Control System*, offering two or more steps of control, depending upon the number and size of compressors, may well be the answer to your particular refrigeration problem.

For example, at Wilson & Co.'s packing plant in Albert Lea, Minnesota, two new Vilter 16-cylinder natural gas engine-driven compressors have a six-step Vilter Close Capacity Control System actuated by saturated suction temperatures. The compressors are controlled with the first and second steps modulating the engine speed of each between 1200 and 900 RPM in sequence. When capacity reduction is required below this point, the compressors are unloaded in four equal stages down to 50% capacity on Compressor No. 2. A sequence changer is provided to distribute compressor wear, as well as to offer a recycling feature.

Some of the characteristics of the Vilter Close Capacity Control System are: accurate, close control over the entire range (especially valuable for low pressures); up to 20 capacity steps; convenience of control by a single adjustment of the thermostat; adjustable control to prevent loading and unloading due to rapid load changes; recycling and sequence changing features.

Wilson has had a long and most satisfactory acquaintance with Vilter equipment. At Albert Lea, Vilter equipment includes: horizontal, vertical and rotary compressors; Pakicers; a blast freezer; Zer-O-Disc fin coils; and many others. Acceptance of Vilter is based on product reliability and competent service.

It will pay you to investigate thoroughly Vilter's complete line of refrigeration equipment and the flexible control systems available for your application.

**Patent Pending*

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Vilter Manufacturing Corporation
Milwaukee 7, Wisconsin

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Write for helpful bulletins to Vilter Manufacturing Corporation Dept. D61-3 2217 South First Street Milwaukee 7, Wisconsin

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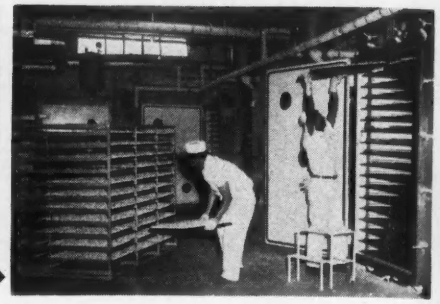
UNITED FRUIT continued

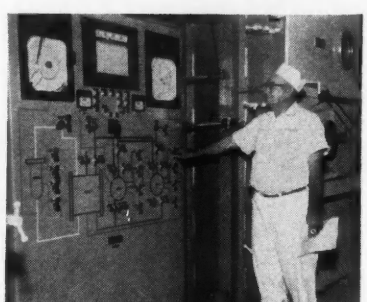
7.



8.

***The trays** of frozen shrimp are quickly loaded into the empty drying chamber by sliding them across onto its shelves from the multi-tiered truck which brought them from the freezer*

***When the shrimp** have been thoroughly dried, vacuum is broken in the Stokes freeze-drying chamber and the trays are quickly unloaded onto another multi-tiered cart and carried into the dehumidified packing room*



9.

***All operations** of the Stokes freeze-drying equipment are controlled from this single control panel. The entire cycle is carried out under full automatic control from beginning to end. If desired, the equipment can be switched to manual control*

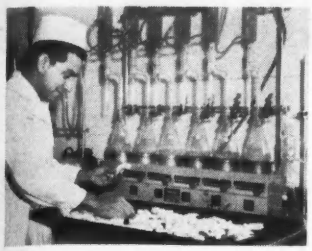
controlled radiant heating system.

The shelves themselves are "Radi-Koted," a special high-emissivity coating developed by Stokes which gives maximum heat-radiation to the product being dried; the chamber's interior is "Reflecto-Koted," another special coating developed by Stokes to prevent heat loss and assure uniform drying of the food on the trays. Both coatings have been approved for use in food processing operations.

Design details are shown in the photo sequence which accompanies this article. Note how the trays of shrimp are mounted between the shelves so that the trays do not come in direct contact with the heated shelves. Radiant heat travels in both directions from each shelf. The trays are perforated so that radiant heat from below readily passes into the shrimp in the tray.

The shrimp are dried rapidly to a point where refrigeration is no longer required. The moisture sublimes from the ice crystals in the frozen shrimp as vapor, without melting. This phenomenon, the basis for the freeze-drying process, is responsible for the preservation of the cellular structure and for the retention of the nutritional and flavor values of the natural shrimp.

The amount of heat is controlled automatically by a specially programmed cycle developed in Stokes' laboratory for United Fruit's products to provide the maximum input consistent with main-



10.

Samples *are taken at every stage of the operation and checked in the quality-control laboratory. These are being analyzed for retention of flavor*

taining the proper conditions of pressure within the chamber and avoiding any damage to the product.

While United Fruit is not revealing any of the detailed results of its improved process, it is known that the drying times have been markedly reduced from those previously required when the trays were placed directly on the shelves. For typical improvements in drying time see the data accompanying illustration 5.

Temperature of the product and pressure in the chamber are continuously recorded during the drying operation to insure quality control.

At the completion of the drying operation, shrimp which weighed seven pounds as raw green shrimp (including the shells) has been reduced in weight to 13½ ounces.

The vacuum freeze-dried product is immediately moved to a humidity controlled packing room where it is automatically weighed and canned. Careful control at this point insures proper dry-packaging of the freeze-dried shrimp for ultimate quality and long shelf life. END

The modern freeze-drying plant described in this article was engineered and built by F. J. Stokes Corporation, 5500 Tabor Road, Philadelphia 20, Pa. 6700 on Reader Service Slip.

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We will gladly send interested technologists the complete report of extended baking tests conducted by a leading food research laboratory. In these tests, refrigerated biscuits leavened with FMC Sodium Acid Pyrophosphate scored first in symmetry, volume, crust color and storage life!

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What's holding back U

UNITIZED SHIPPING?

Almost everyone in the food industry wants it . . . or do they?

NORB LEINEN Associate Editor

IN JULY, FOOD PROCESSING published an article by material handling and warehouse authority Irving M. Footlik urging adoption by the food industry *now* of unitized shipping techniques already in use in some non-food industries.

Copies of this article were sent to several dozen leading food processors for their comments — pro or con.

In most cases, there was no comment whatsoever. In those few cases where replies were received, the remarks were so general and so circumspect that all that could be inferred was that these major processors were for progress.

Consider three typical replies.

Food processors hedge as indicated by typical replies:

"As you know, we are aware of the developments which Mr. Footlik calls attention to, and our marketing and research staffs are, have been, and will continue to be importantly engaged in activities generally aimed at the objectives Mr. Footlik identifies."

The second food-processor comment is along the same rich vein:

"Substantial shipping tests are presently being made by our company between our own facilities, and while we know that there are potential labor cost and transportation damage reductions inherent in palletized or unitized shipping, it would be too early to make any definite remarks indicating a company policy in this direction."

As one of the correspondents put it — and this may possibly sum up current prevalent food-processor attitude toward this whole mysterious subject of unitized shipping:

"We did read with interest Mr. Footlik's article, and thank you for the opportunity to preview it. We decided, however, that we have nothing of general interest to suggest for inclusion in the article at this time."

How about the chains? Admitting temporary defeat insofar as the processing segment of the industry was concerned, the next step was an approach along similar lines to the *customers* of the food processors — the supermarket chains, voluntaries and co-ops.

It was reasoned that perhaps they might have more of a savings ax to grind on shipping costs, since they in actuality are the *shippers* once they assume ownership of a consignment at the processor's loading point. Here, although replies were not abundant — possibly again indicating pessimism, indifference or a deep-seated reticence — some specific opinions were presented.

In some cases, the respondents confined themselves to comment on Irving Footlik's July FP article proposal of a widespread food-industry adoption of several forms of sectionalized small-case mixed-unit-loads.

The Head Grocery Buyer of a major Eastern retail food chain, for example, said:

"At first blush, I can see so many drawbacks to this system (of unitized or containerized units) that it makes the advantages hard to measure. The biggest disadvantage I see is that under present available methods, I do not know how a shipper would load this type container, and how we, on the other hand at the receiving end, could unload it.

"Obviously, merchandise is moved one case at a time in most instances on a store level; this might well be worked out. But as of now, we do not know the answer."

This opinion is shared by Mr. Henry J. Eavey, president of Henry J. Eavey, Inc., Richmond, Ind.:

"It would seem to me to be rather difficult to standardize on unitized loads of package goods on a 'pass through' basis (minimizing wholesale-level handling). In other words, every warehouse supplies some smaller stores

***Pallets** are the roadblock to progress, say some handling-shipping experts. Permanent ones like these cost too much to give away. One-way pallets have not been successful. Pallet pools have not worked. Yet, thus far, eliminating the pallet simply has introduced new problems.*

One possible solution — local markets, such as depicted, for resale of pallets by receiver

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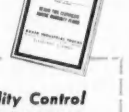

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along with the bigger ones. Generally speaking, a great portion of the individual items of merchandise do not move — even from the big stores — [at the rate of] very many cases a week.

"For instance, Mr. Footlik mentions baby food. While baby food in total volume of cases shipped is a very big item, there are many of the individual cases of vegetables and fruits that sell very much lower than others."

Mr. Eavey then concedes an advantage to Footlik's proposed method, but does not see how this will provide a saving benefit to the wholesale food distributor:

"The only advantage, it would seem to me, to a distributor, would be that the goods, on arrival, would not have to be hand-stacked on pallets — if they came already unitized on some sort of pallet. Here again, however, if the goods arrive by truck, most distributors insist that the driver of the truck do the palletizing. The personnel of the distributor simply pull away the loaded pallets."

In line with Mr. Eavey's statement regarding difficulty of standardizing on unitized loads of package goods for both small and large stores indiscriminately, is this quote from John M. Alexander, Operations Superintendent, Certified Grocers of California, Ltd., Los Angeles:

"We have established a credit and debit system for shipment of palletloads to member stores. Some of our stores — particularly the discount operations — are receiving merchandise in pallet quantities and moving them directly into selling area."

The emphasis here, of course, is on discount operations.

Direct shipment? — No! Another progressive chain operation — Hillman's of Chicago — has been shipping to its stores on a completely palletized basis for about 10 yr. Palletloads are mixed, and are shipped on a daily-delivery basis to the stores, which then proceed to unload and move them by means of manual pallet jacks.

However, regarding shipment of unitized quantities of standard grocery items direct-

ly to stores, Gardner H. Stern, Jr., Director of Operations for Hillman's, is less enthusiastic, and gives this reasoning:

"In the first place, the growing number of items, and lack of shelf space, is cutting down the average weekly movement per item. Thus, a full palletload of even a fast-moving item can represent several weeks' supply (Note Mr. Eavey's statement above — Ed.).

"Hillman's is in the vanguard of supermarket chains working on reducing inventory at store level. Our rather unique system permits the stores to order any grocery item any day of the week. Our policy is for the stores to order only what they need on their shelves, and to keep backroom stock at a minimum.

"We do not look favorably on any handling method which would tend to build up inventory at store level.

"Because of the tremendous number of variables which affect movement (different neighborhoods, advertised items, display, weather), it would also be difficult to ship sectionalized small-case mixed-unit loads, such as suggested in Mr. Footlik's article.

"This concept is limited, anyway, to categories of merchandise wherein a large number of items are bought from the same supplier, and are of sufficiently uniform case size to make mixed unit loads possible. Offhand, baby foods are about the only possibility."

Mr. Stern then notes the great trend toward tray-pack of grocery items at the retail level, and credits this handling method with lowering costs for Hillman's. He also acknowledges that:

"Sleeve-pack in conjunction with tray-pack (advocated by Footlik) is desirable to retailers, but only practical if the manufacturer can convert his entire packaging line to this method.

"Jewel (Tea Company, Chicago) has experimented with the shipment of unitized tray-packed items, overwrapped with kraft paper, rather than the usual corrugated carton, on their own private-label canned foods.

"Although we haven't discussed it with them lately, I believe they had some prob-

BEGINNING: A NEW ERA IN AEROSOL FOODS

FDA regulation accepting "Freon" C-318 as a propellent for food products opens big, new, profitable markets for you

Up to now, whipped cream was about the only food product packaged in aerosol cans. Now other foods can attain the same convenience and sales appeal already well known for such aerosol products as shaving cream, toothpaste and paint. Du Pont FREON* C-318 propellent is fully accepted by the FDA for aerosol foods. This clears the way to package numerous other food products in aerosol form.

What foods go in aerosol cans with C-318?

Any food product of low to moderate viscosity that can be dispensed as a spray or foam. Although C-318 may be used alone, for immediate applications it will probably be blended with nitrous oxide. Either way, it means new, profitable food packaging opportunities. As a replacement for some of the nitrous oxide in the whipped-cream can, it greatly improves stability and appearance of the dispensed product. Probable new uses are salad dressing, whipped butter, cream cheese, dessert toppings and cake frostings. Doubtless many others will come along!

What advantages does C-318 give?

Besides convenience and ease of use, the main improvement is that a greater quantity of food is dispensed from the can. That's because, unlike current gas propellents used for whipped cream, C-318 is partially liquid and exerts pressure right to the end. A better product results too—improved stiffness, stability and color retention. And "Freon" C-318 is odorless, tasteless, non-toxic, and very stable—so food quality is unchanged.

Get more information

If you have in mind a food product which might be packaged in aerosol form, write or call Du Pont for specific information. The wealth of data compiled by Du Pont scientists during the development of C-318 is available to you. Address: Du Pont Company, "Freon" Products Division, N-2420, Wilmington 98, Delaware.

**Freon is Du Pont's registered trademark for its fluorocarbon propellents. Chemically, "Freon" C-318 is octafluorocyclobutane.*

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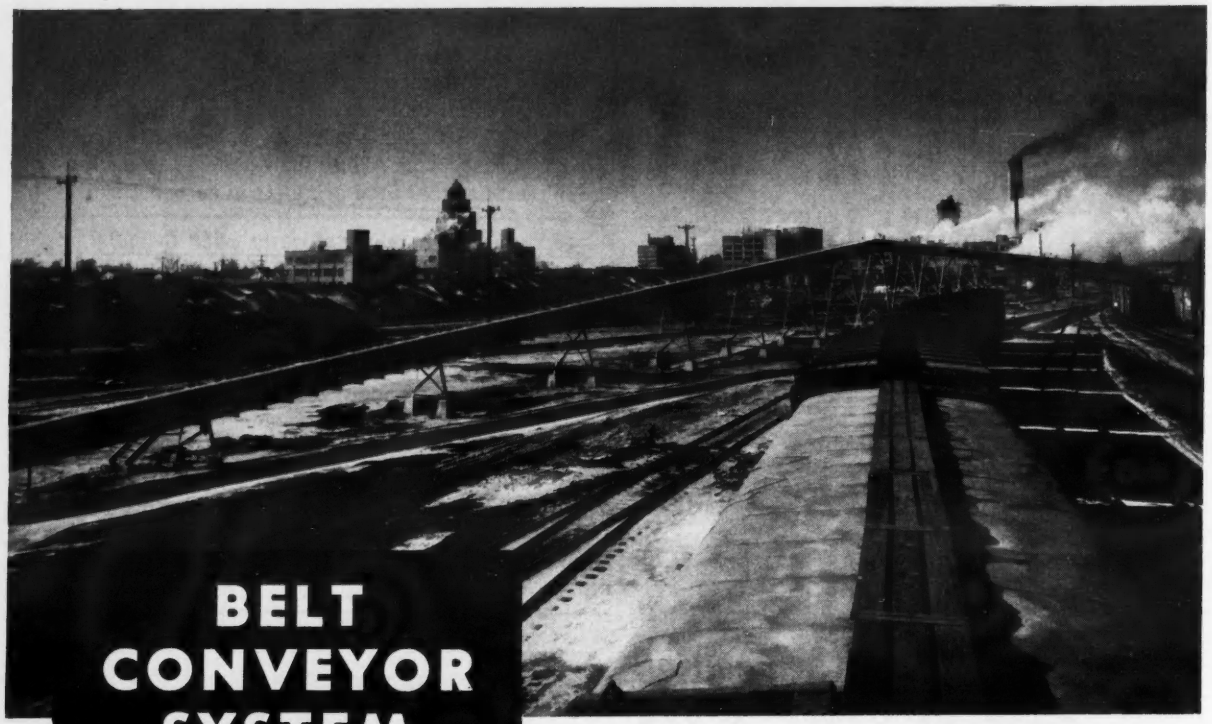


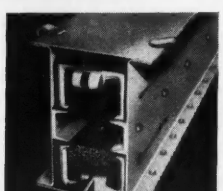
BELT CONVEYOR SYSTEM saves leading food processor up to $90,000 in year's operation

"World's Longest Grain Belt Conveyor," a half-mile STEPHENS-ADAMSON Belt Conveyor System at the A. E. Staley Mfg. Co., Decatur, Illinois, saved its owner nearly $90,000.00 in its first year of operation.

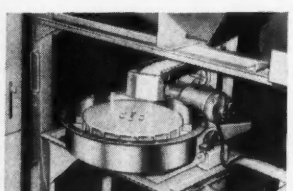
The conveyor system moves up to 224 tons of corn hourly — 192,000 bushels a day — from below the 2 million bushel capacity terminal elevator to the top of the processing plant holding elevator a half mile away.

Besides speeding corn handling to an equivalent of 100 grain cars per day, the installation provides a transfer system with better control, assures cleanliness of the corn, and eliminates spillage. Reduced handling costs per ton have resulted in considerable savings in over-all operating expenses.

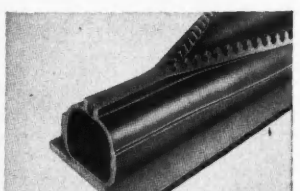
S-A ENGINEERED CONVEYOR PRODUCTS FOR FOOD HANDLING SYSTEMS



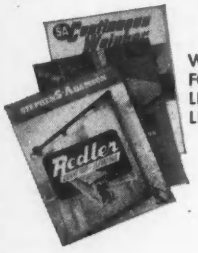
S-A REDLER CONVEYOR-ELEVATORS BULLETIN 358



S-A CONTINUOUS WEIGHER BULLETIN 958



S-A "ZIPPER" CLOSED-BELT CONVEYOR-ELEVATOR BULLETIN 349



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ENGINEERED BULK HANDLING SYSTEMS
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lems in getting manufacturers to convert their packaging lines — but it's a good idea in terms of savings at retail level."

Mr. Carl Dickerson, Warehouse Superintendent of March Supermarkets, Inc., Yorktown, Ind., foresees still another problem regarding shipping cartons: "The unit load principle may create an even greater problem in packing and shipping case design. Many shipping cartons offered by suppliers are doubtful entries in the field of unit load handling and transportation."

Indirect shipment? Yes! On the sunny side, Mr. Stern believes that there is considerable potential for unitized shipping from manufacturer (processor) to retailer warehouse:

"Hillman's has received experimental rail cars of palletized Dole pineapple products, which resulted in considerable manhours' saving in the unloading operation. Despite our use of an unusual pallet (48 by 40, wing-type), we placed the Dole pallet on top of ours and were able to stack these double pallets quite effectively.

"It is our belief that, if manufacturers and retailers can establish one or two mutually agreeable pallet sizes and shapes, many more items can be shipped palletized via rail car, with considerable savings

"After operating expenses and taxes, we cleared a small profit . . ."

in loading and unloading. We could easily afford the necessary materials handling equipment at our end."

Mr. Dickerson seconds this thought: "If the volume of unitized shipment were great enough, purchase of necessary equipment would be made. It would not be difficult to determine if you could justify the cost of equipment to do this job, based on reduction of unloading manhours on an estimated number of tons received in unit loads."

Regarding the receipt of merchandise via truck trailer, Mr. Stern believes that the same concept could apply.

In addition, he reports that Hillman's now is supplying pallets to several of its suppliers, most of which have local (Chicago-area) facilities. These companies pick up pallets each time a delivery is made to Hillman's warehouse, and use them for the next shipment.

The problem here is that the supplier must have the equipment and general handling system to accommodate Hillman's particular pallet.

Restating the problem, Mr. Stern's reference to possible pallet-handling gets back to what is perhaps the basic continuing hurdle — the pallet and its return.

Hillman's supplies pallets to its suppliers, for use with shipments to Hillman's.

Certified of California also expedites receiving operations in its local (Los Angeles) area by means of "numerous pal-

But the fact that not all food let-exchange arrangements." distributors have reached

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EDITOR'S NOTE: This article is based on the informed opinion of a small segment of the giant food industry. As mentioned at the beginning, many food companies — particularly processors — are reticent, puzzled or apathetic concerning unitized shipments and the implications for savings.

In an effort to further the climate of progress already established by Irving Footlik and those cooperating in his series of Exploratory Meetings on Unitized Shipping, FOOD PROCESSING will continue to cover this subject in future issues.

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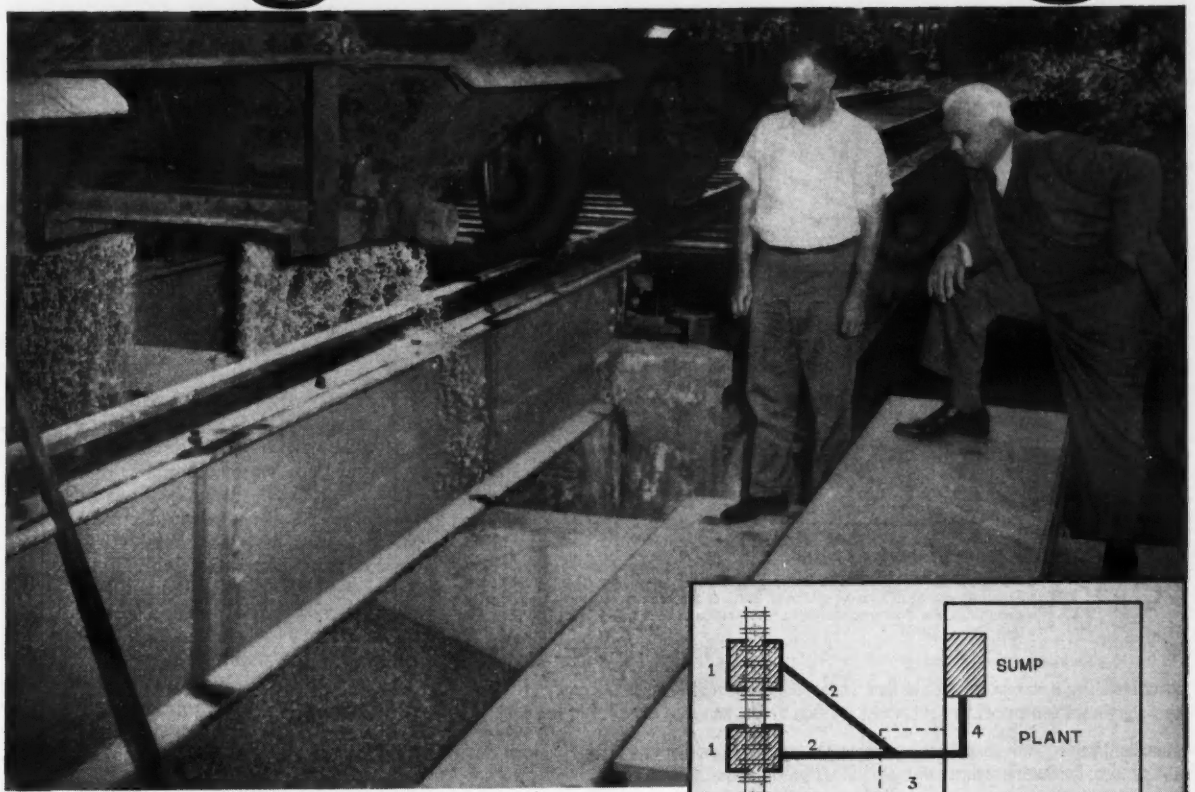
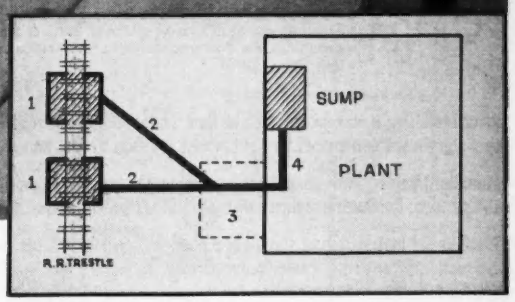
salt engineering





Pipes (2) deliver brine from new 55-ton Lixators (1) to existing pipe line (4) that served old Lixator (3). New construction made maximum use of existing installation—did not affect railroad trestle or plant interior.

New approach to brine making cuts salt unloading time 32 man-hours per car

At this N. J. plant Sterling Rock Salt used to be unloaded manually into a chute feeding a brine tank located ten feet from the tracks. Cost of the operation: an expensive 32 man-hours per car. Furthermore, the 60-ton brine tank had to be exhausted down to ten tons before another 50-ton carload of salt could be added, creating problems of reserve and scheduling.

An International Salt Company Technical Service representative and the plant manager solved the situation by installing two 55-ton Sterling Storage Lixators under the existing railroad trestle. Salt drops directly from the hopper cars into them. Gravity supplies the labor, releasing the 32 man-hours. And when the Lixators* get down to 30 tons each, a 50-ton carload tops them off with 25 tons apiece. Ordering is simplified, and the buyer never has to worry about reserve. And how does the salt get to points of use? Simple. The Lixators produce crystal-clear, fully saturated brine *automatically*. Pipes carry it into the plant.

Local contractors competed for the job by sealed bids estimated from complete plans supervised by International's Technical Service Department.

This project is a good example of how International salt engineering can benefit salt users. If you're interested in unequaled technical assistance on any phase of salt handling, storage or dissolving, write International Salt Company, Clarks Summit, Pa., or nearest district office.

*Registered T.M. International Salt Company

BOSTON CHARLOTTE CINCINNATI NEWARK NEW YORK PITTSBURGH
BUFFALO CHICAGO DETROIT NEW ORLEANS PHILADELPHIA ST. LOUIS

INTERNATIONAL STERLING SALT SALT COMPANY
"A STEP AHEAD IN SALT TECHNOLOGY"

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"We felt we had to go with the best. We insisted on a Nukem steel plate floor!"
Conrad Knutson
FRANKLIN CREAMERY, INC.
Nukem
STEEL PLATE FLOORS
Raised face of steel plates allows milk cases to slide—even when stacked 5 high—yet prevents foot slippage. Steel plate cleans easily by flushing with hot water.
Nukem Multibond A, acid-resistant cement, protects underside of steel plates against corrosion and food acid attack.
Nukem Nu-Mastic "floats" entire steel floor on an acid-resistant flexible cushion that absorbs stresses.
The structural slab is completely protected and kept moisture free.

Nukem steel plate floors can be installed over either new or old floors. Qualified contractors equipped to serve you in all parts of the country, will insure your getting a genuine Nukem floor engineered to your particular needs.

After installing a Nukem steel plate floor in the cooler room of Franklin Creamery at Minneapolis, this significant and unsolicited statement is made by Mr. Knutson, treasurer of the firm.

Franklin Creamery's previous floor was concrete, with the exception of a small area having a quarry tile surface. Continuing maintenance difficulties prompted the selection of steel plate construction.

Prior to the installation of the steel plate floor, four men (plus relief men) were required to handle production through the cooler room. In-floor conveyors and Nukem steel plate floors have reduced this to two men—yet production has been increased!

Steel plate is the best possible flooring surface for dairy cooler rooms. It permits the installation of flush-with-floor conveyors systems, withstands impact of dropped milk cans, and allows milk cases to be skidded to and from trucks.

Proper engineering—and materials developed specifically for this type of installation—are absolutely necessary. For example, if plates are laid directly on concrete, expansion and contraction will eventually cause the plates to buckle and loosen. Milk, water and cleaning compounds seep beneath the plates; this results in bacteria growth, bad odor, poor sanitation, destruction of the concrete slab, constant maintenance problems and possible replacement of the entire floor.

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happy solutions with regard to pallets and unitized loads is evident from the attitude of National-American Wholesale Grocers' Association's David Gardenier.

Pointing out that NAWGA believes that steps should be taken to develop unitized shipments with respect to distributors, suppliers and products, he cites three areas where NAWGA is canvassing information from its membership:

1) What items are consistently purchased in large multiples of pallet quantities?

2) What is the impact of these shipments on total handling costs of the supplier: In other words, can we develop through these products a significant reduction in handling costs if unitizing could be achieved?

3) What actions can be taken jointly between our distributors and the suppliers of these products to develop, individually, agreements whereby unitized shipments can become an established procedure?

But Mr. Gardenier acknowledges difficulties — namely, pallet return. As he puts it:

"Aside from the obvious difficulty involved in the wide variation of shipping carton sizes, the pallet, even though standardized as to size, continues to be the biggest handicap to development of unitized shipment.

"The return problem particularly is one for which there seems to be no acceptable answer covering all cases."

A universal solution to the pallet-return problem? Perhaps Certified of California's Alexander had Irving Footlik's sectionalized small-case mixed-unit loads in mind when he wrote:

"We sincerely believe the pallet will eventually disappear, and other methods of transporting unit loads will be used by food warehouses."

But these other methods — as noted by Mr. Eavey, Mr. Stern and others cited above — are very likely to bring along their own problems. END

Next month we present straight answers on "What's holding back unitized shipping?" by George Bozini, Director of Traffic for Dole Corporation, a leading food processor.

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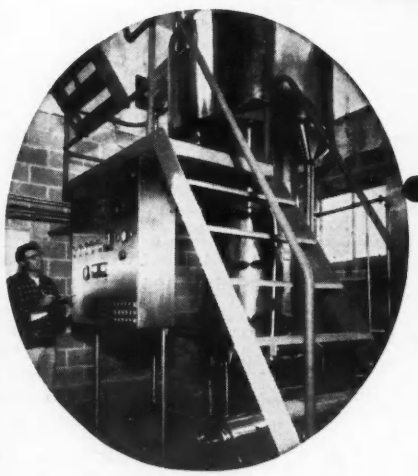

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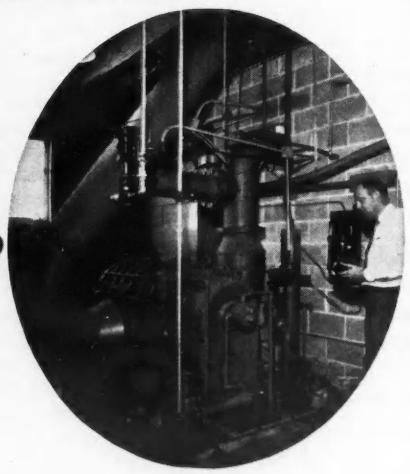

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Quality changes in frozen foods

Alignment chart speeds computations

W. B. VAN ARSDEL
Western Regional Research Laboratory USDA

Accompanying table and nomograph enable one to quickly compute changes occurring in quality of frozen foods in accord with their temperature-time history.

Last column in Table 1 indicates number of days required to bring about a perceptible quality change in various frozen products held at a steady temperature of 0° F. The difference between this figure and the computed effect of a specified temperature experience represents the number of days the product can still be held at zero before quality change becomes perceptible.

To find the changes in quality for a frozen product stored at other temperatures than zero including those experiencing a series of temperature changes, one uses the nomograph to compute the equivalent time at zero; then compares this equivalent time with the figures in the last column in the table.

Although the procedure is illustrated only by examples in which the irregular temperature experience is reduced to equivalent length of time at zero, the results can readily be expressed in terms of time at any other steady temperature, such as 10° or 20°.

THE INFORMATION about stability of frozen foods at temperatures of 0°F. and higher which was obtained in USDA's comprehensive Time-Temperature Tolerance investigations[1] can be used by engineers and food technologists for a variety of purposes. These include design and operation of transport vehicles, frozen storage rooms, freezing equipment, and distribution facilities, as well as guidance in the drafting of regulations or standards of operating practice.

Use of the results is facilitated by the accompanying nomograph and tables, which quickly solve one common type of practical problem.

During the transfer of frozen foods from one place to another the necessities of practical handling expose the product to more or less increase in temperature, and time is required to bring temperatures back to the desired level — whether that be 0°F or something lower. Some change in the quality of the product is inevitable.

Physical and chemical effects of aging gradually accumulate. Eventually the odor, flavor, or appearance is noticeably different from that of the freshly packed product. Trained panels of judges can detect the arrival of this condition with good accuracy.

We use the results obtained by trained panels in our laboratory to determine the average *temperature quotient* for each commodity. Designated by the symbol q_{10}, this is the

Table 1 Average Temperature Quotient and Stability at 0°F for Various Frozen Foods

Commodity	Pack	Quality Tested	Temperature Quotient q_{10}	Temperature Range °F	Stability at 0°F Days
Beef (1)	....	Flavor	2.9	0° to 20°	*
Boysenberries	IQF (2)	Flavor	3.1	10° to 30°	390
	Siruped (3)	Flavor	5.1	10° to 30°	650
	IQF (2)	Color	2.8	10° to 30°	310
	Siruped (3)	Color	3.6	10° to 30°	650
Cauliflower		Flavor	3.4	−10° to 20°	365
Chicken, cut-up	Well packaged	Odor, raw	2.4	0° to 20°	730
		Flavor, cooked	2.0	0° to 20°	730
Chicken, fried	Paperboard, box	Flavor	2.0	0° to 20°	270
Fish (4)	....	Flavor	1.6	−20° to 15°	*
Green beans		Flavor	3.2	0° to 25°	300
		Color	3.6	0° to 25°	100
Orange juice concentrate (5)		Flavor	3.7	15° to 20°	....
		Cloud	7.5	5° to 25°	275
Peaches	Composite cartons	Color	7.8	10° to 25°	365
Peas		Flavor	3.4	0° to 25°	320
		Color	4.2	0° to 25°	210
Pork (6)	....	Flavor	3.2	0° to 20°	*
Raspberries	(7)	Flavor	6.6	10° to 30°	730
		Color	6.6	10° to 30°	900
Spinach		Flavor	3.4	−10° to 20°	140
Strawberries	(8)	Flavor	5.6	0° to 30°	365
		Color	5.6	0° to 30°	365
Turkey dinners and pies	....	Flavor	4.0	10° to 20°	*

(1) Tressler and Evers, 3rd Ed., 1957.
(2) IQF = individually quick-frozen, in cartons.
(3) In composite cartons, 3 + 1 in 50% sucrose sirup.
(4) Means of reports by Kuprianoff, Dyer, Kondrup.
(5) Du Bois and Kew, Refr. Engin. 59: 772 (1951). Juice not heat-treated.
(6) Tressler and Evers, 3rd Ed., 1957.
(7) In composite cartons, 3 + 1 in 50% sucrose sirup.
(8) In composite cartons, 4 + 1 in dry sucrose.
*Lack of real definition of "quality change" in the published reports on beef, pork, and fish, and lack of data at zero on turkey dinner and pies accounts for the missing figures

The alignment chart presents a graphical solution of the equation:

$$f = 0.434\,(10^{A})\left(\frac{10^{B}-1}{B}\right). \qquad (I)$$

Here f is the equivalent experience, days at 0°F per day,
$A = 0.10\ t_1 \log q_{10}$,
$B = 0.10\ (t_2 - t_1) \log q_{10}$,
q_{10} is the temperature quotient, for 10°F,
t_1 is the lower of the two temperatures, °F,
t_2 is the higher of the two temperatures.
The equation is derived as follows:

If the temperature quotient is constant, the rate at which color or flavor changes must be an exponential function of temperature:

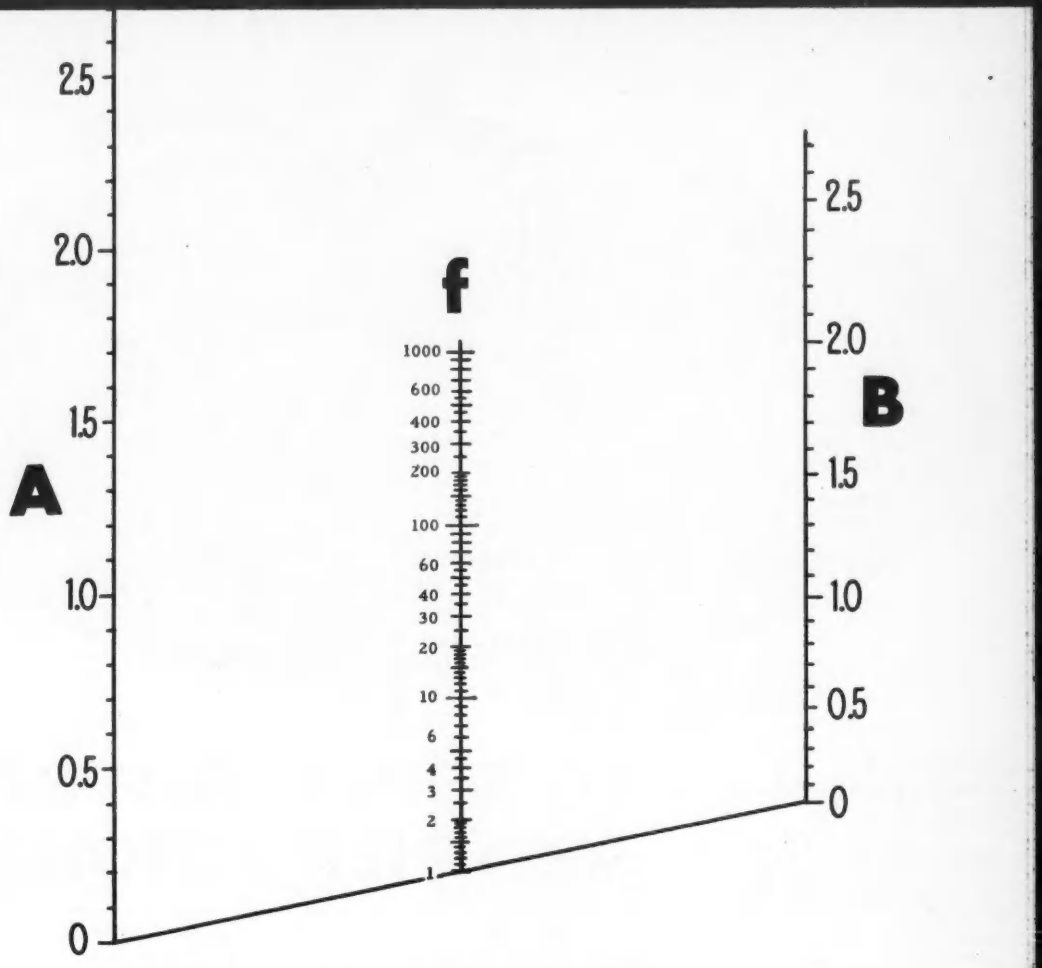
$$r = \frac{dL}{d\theta} = a\,(10^{bt}). \qquad (II)$$

Here a = 1/time (days) at 0°F to a perceptible change.

The temperature is assumed to change linearly with time for a total of θ_e days:

$$t = t_1 + \frac{\theta}{\theta_e}\,(t_2 - t_1). \qquad (III)$$

Then an equation of the form of (I) results when t in equation (II) is replaced by its value from equation (III), and the resulting differential equation is integrated subject to the condition that L = 0 when $\theta = 0$, and noting that $f = L_e/a\theta_e$, where L_e is the total quality change at the end of the θ_e days.



REFERENCES CITED

1. Technical reports on Time-Temperature Tolerance of Frozen Foods, numbered I through XXIII, Food Technol., 1957-1961.
2. Conference on Frozen Food Quality, Albany, Calif., Nov. 4-5, 1960. ARS-74-21. A. L. Shepherd, pp. 18-23.
3. TTT No. XV., W. B. Van Arsdel and D. G. Guadagni, Food Technol. 13, 14-19 (1959)
4. Conference on Frozen Food Quality. H. Lineweaver, pp. 10-12.

ratio of the time required to bring about a perceptible change at some one constant temperature to the time required at a temperature 10°F higher. The time is always shorter at the higher temperature.

Experiment has shown that the temperature quotient is not only fairly constant within the range of temperatures from about 0°F to 30°F (that is, we find nearly the same ratio of times between 20° and 10° as between 10° and 0°) but also differs quite widely from one commodity to another.

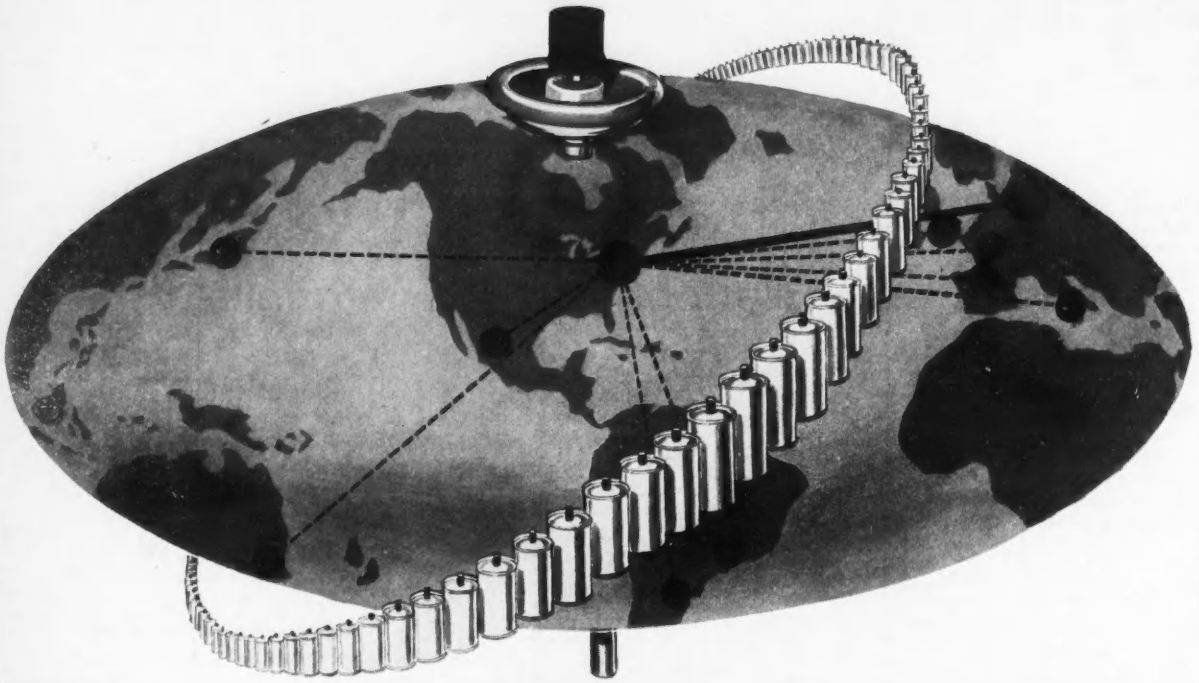
Table 1 lists the average temperature quotients for several important frozen foods. Variations in the commodity itself or in the processing or package characteristics introduce some variability in the temperature quotient;[2] estimates based on these averages are naturally subject to the same margin of possible error.

A procedure of graphic integration[3] can be used for calculating the total quality effect of exposure to an irregu-

Table 2 Value of A (with t_1) and B (with $t_2 - t_1$)

q_{10} *	0° F	2° F	4° F	6° F	8° F	10° F	12° F	14° F	16° F	18° F	20° F	22° F	24° F	26° F	28° F	30° F
1.6	0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.29	0.33	0.37	0.41	0.45	0.49	0.53	0.57	0.61
1.7	.00	.05	.09	.14	.18	.23	.28	.32	.37	.41	.46	.51	.55	.60	.64	.69
1.8	.00	.05	.10	.15	.20	.26	.31	.36	.41	.44	.51	.56	.61	.66	.71	.77
1.9	.00	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
2.0	0.00	0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
2.2	.00	.07	.14	.21	.27	.34	.41	.48	.55	.62	.68	.75	.82	.89	.96	1.03
2.4	.00	.08	.15	.23	.30	.38	.46	.53	.61	.68	.76	.84	.91	.99	1.06	1.14
2.6	.00	.08	.17	.25	.33	.41	.50	.58	.66	.75	.83	.91	1.00	1.08	1.16	1.24
2.8	.00	.09	.18	.27	.36	.45	.54	.63	.72	.81	.89	.98	1.07	1.16	1.25	1.34
3.0	0.00	0.10	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86	0.95	1.05	1.15	1.24	1.34	1.43
3.2	.00	.10	.20	.30	.40	.50	.61	.71	.81	.91	1.01	1.11	1.21	1.31	1.41	1.51
3.4	.00	.11	.21	.32	.43	.53	.64	.74	.85	.96	1.06	1.17	1.28	1.38	1.49	1.59
3.6	.00	.11	.22	.33	.45	.56	.67	.78	.89	1.00	1.11	1.22	1.34	1.45	1.56	1.67
3.8	.00	.12	.23	.35	.46	.58	.70	.81	.93	1.04	1.16	1.28	1.39	1.51	1.62	1.74
4.0	0.00	0.12	0.24	0.36	0.48	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.69	1.81
4.2	.00	.12	.25	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.37	1.50	1.62	1.75	1.87
4.4	.00	.13	.26	.39	.51	.64	.77	.90	1.03	1.16	1.29	1.42	1.54	1.67	1.80	1.93
4.6	.00	.13	.27	.40	.53	.66	.80	.93	1.06	1.19	1.33	1.46	1.59	1.73	1.86	1.99
4.8	.00	.14	.27	.41	.55	.68	.82	.95	1.09	1.23	1.36	1.50	1.63	1.77	1.91	2.04
5.0	0.00	0.14	0.28	0.42	0.56	0.70	0.84	0.98	1.12	1.26	1.40	1.54	1.68	1.82	1.96	2.10
5.5	.00	.15	.30	.44	.59	.74	.89	1.04	1.18	1.33	1.48	1.63	1.78	1.92	2.07	2.22
6.0	.00	.16	.31	.47	.62	.78	.93	1.09	1.25	1.40	1.56	1.71	1.87	2.02	2.18	2.33
6.5	.00	.16	.33	.49	.65	.81	.98	1.14	1.30	1.47	1.63	1.79	1.95	2.12	2.28	2.44
7.0	.00	.17	.34	.51	.68	.85	1.01	1.18	1.35	1.52	1.69	1.86	2.03	2.20	2.36	2.53
7.5	.00	.18	.35	.53	.70	.88	1.05	1.23	1.40	1.57	1.75	1.93	2.10	2.28	2.45	2.62
8.0	.00	.18	.36	.54	.72	.90	1.08	1.26	1.45	1.63	1.81	1.99	2.17	2.35	2.53	2.71

*Temperatures at head of columns are for t_1 to find A and for $t_2 - t_1$ to find B



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larly changing temperature. The procedure requires drawing a special coordinate net for each different commodity to be handled.

No better way has been discovered to solve the general problem, but there is a convenient short-cut that can be taken if the temperature quotient for the commodity is substantially constant and the temperature can be assumed, closely enough, to rise or fall proportionally to the elapsed time — in other words, if the temperature change is linear.

This short-cut procedure involves looking up the temperature quotient q_{10} in Table 1, then finding A and B in Table 2 in the horizontal row corresponding to the q_{10}. A will always be found in the column equal to the lowest temperature t_1; B in the column equal to the difference in temperature $t_2 - t_1$ where t_2 is the upper temperature. A ruler or straight-edge laid on the chart through points A and B crosses the center scale at a point where the scale reading is "f", which is the ratio used to obtain equivalent time at zero storage.

Example: Assume that the temperature of a package of frozen green beans changes from 8° to 22° in 12 days, then from 22° down to 0° in 10 days, both the rise and the subsequent fall in temperatures being approximately linear. What change in quality would be expected on the average for good quality green beans subjected to this time-temperature experience?

First we break up the experience into the two separate segments for which the temperature experience is given; the change will be calculated separately for each and the two results will be added. For the first segment the lower of the two temperatures, t_1, was specified as 8°F. The change in temperature, $t_2 - t_1$, was from 8° to 22°, or 14°.

Now from Table 1 we find the average temperature quotient for the change in flavor of green beans — 3.2. In the lefthand column of Table 2 we locate this value of q_{10}, 3.2, and in that horizontal row under the column headed 8°F we find the value of A, namely 0.40. Similarly, in the same

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horizontal row (for $q_{10} = 3.2$) under the column headed 14° we find the value of B, 0.71. A straight line between 0.40 on the A scale and 0.71 on the B scale cuts the f scale at a point a little above the graduation marked 6; we shall estimate the reading as 6.2.

The meaning of this number is that *each day* spent in this segment of the temperature experience has, on the average, the same effect on the flavor of the green beans as 6.2 days of holding at a steady temperature of 0°F. Since this segment was specified to occupy 12 days, the total effect is the same as holding the beans for 74 days at 0°F.

Similarly, for the second segment of experience, Table 2 in the line corresponding to $q_{10} = 3.2$ gives a value of 0 for A (since t_1, the lower of the two temperatures, is 0°F) and 1.11 for B (since $t_2 - t_1 = 22$°F). The alignment chart puts the intersection with the f scale a little above the graduation for 4.5; we estimate the reading as 4.6 — that is, each day spent in this segment is equivalent to 4.6 days at 0°F. Since we specified 10 days for this experience, total effect in this segment is the equivalent of holding for 46 days at 0°.

Now, putting the two segments together, the total effect on the flavor of the green beans is the same as holding them for 120 days at 0°F.

For some applications, this is the complete answer. For other purposes we can usefully carry the calculation one step farther and determine what is the significance of this computed length of time at 0°F. How much change in quality does this indicate?

Actually, this question must be replaced by one that is more clearly defined, namely: How does this calculated length of time at 0° (120 days in the example) compare with the exposure that would produce a change in flavor (or color, if that is the characteristic being used as a criterion) detectable by a trained panel?[4]

Here the Time-Temperature Tolerance investigations give us 300 days at 0°F for a detectable change in flavor of green beans at 0°F; the experience of our example was equivalent to 40 per cent of this. We

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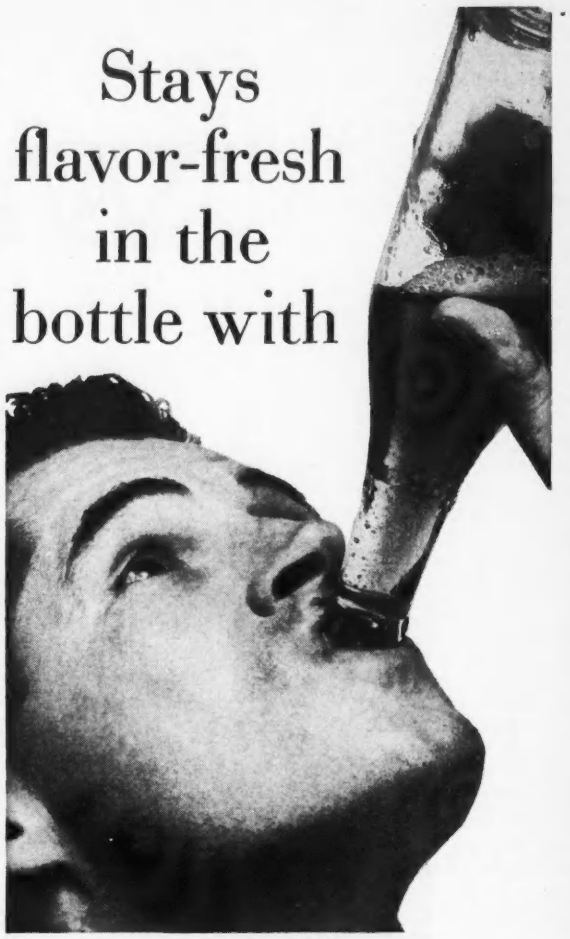

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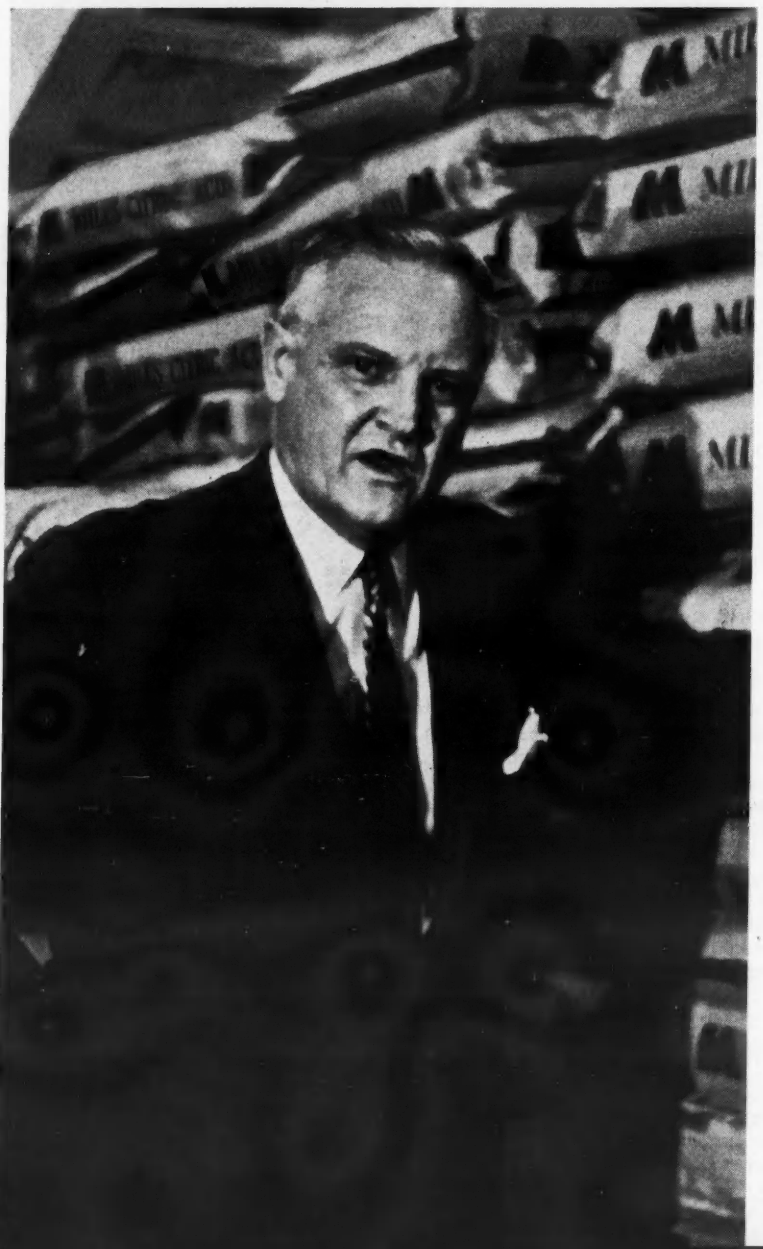

"One-supplier" dependence . . . no matter how good that supplier . . . is clearly a dangerous practice — says Howard F. Roderick, President, Miles Chemical Company.

We used to be dependent on just one supplier for citric acid. For obvious reasons, we didn't like it. Because no one supplier is completely safe from trouble. Fires, floods, process problems, transportation difficulties and national emergencies can cripple any supplier's ability to serve your important needs.

To beat this "one-supplier" situation we began manufacturing citric acid to fill our own needs. And we built plenty of extra capacity to help relieve other users from supply pressures. Because Miles has invested over $12 million in plant and development costs, industry now, for the first time, has the extra protection of competitive buying for this vital commodity.

Reactions to this important step have been interesting. Some buyers, like Miles, are deeply concerned over the "one-supplier" relationship. They react by dividing their business on a rational basis.

Others move in the same buying-habit patterns as if unaware that the market now offers freedom of choice and all the opportunities which this new condition implies.

all of your business"...

We feel a word of caution is in order. Anything approaching total dependence on one supplier . . . even if we are that supplier . . . is a dangerous purchasing practice.

May we suggest that you examine your company's citric acid buying plans? The market has changed. Have your people taken the extra measure of caution which this new broadened market situation warrants?

Miles products for the industry:

In addition to citric acid, Miles Chemical Company can fill your needs for sodium citrate, for fine organics, or antioxidants, and can provide the widest choice of commercial enzymes available from any supplier. For information about any of these products write Miles Chemical Company, Division of Miles Laboratories, Inc., Elkhart, Indiana.

"Competitive buying from well-qualified suppliers remains the purchaser's best protective measure."

Dean Ammer, Executive Editor of *Purchasing* Magazine, when queried for an opinion on competitive buying, responded: "Competitive buying from well-qualified suppliers remains the purchaser's best protective measure. That this procedure is a cardinal rule of good purchasing practice is reflected in the written purchasing policy of practically every leading manufacturer. In no other way can the purchaser be confident of the most reasonable price for the quality he requires . . . nor . . . as importantly . . . can he have protection of vital supplies in times of crises in the market."

MILES CITRIC ACID

C-9-1

6712 on Reader Service Slip.

conclude that a trained panel would be unable to detect the amount of change that would be produced by this time-temperature experience.

The last column in Table 1 gives the average length of time required to produce a detectable change in quality of various frozen foods at a steady temperature of 0°F.

Practical aids for better supervision

Introduction to "Management Information," publication service for increasing leadership of supervisors to attain greater company efficiency, is presented in 12-page ring-bound brochure offered by Elliot Service Company, Inc., 30 N. MacQuesten Parkway, Mount Vernon, N.Y.

Entitled Successful Supervision, brochure presents outline of service to supervisors and supplementary features available to subscribing executives.

It contains samples of the four publications that are included in annual subscription: multi-feature issues, motivation studies, boss-to-boss dialogues and databooks.

6713 on Reader Service Slip.

Top flavor chemists meet and report

A symposium on Flavor Chemistry, held earlier this year under the sponsorship of Campbell Soup Company, brought together some of the outstanding scientists in this field.

Analytical techniques and flavor components of meat, chicken, fish, oils, milk and cheese were reported on by 16 prominent scientists.

Isolation of the very minute quantities of the flavor components and their precursors has been made possible by the better isolation techniques described.

The "Proceedings of the Symposium" have been published. A limited number of copies are available to readers of Food Processing.

Address requests to Dr. Carl H. Krieger, Director — Basic Research and Product Development, Campbell Soup Co., Camden 1, N. J.

Sums up hygenic quality in a single number

Nation-wide audit rates your product, shows how it compares with competition

TO PROVIDE food manufacturers with a dependable biological quality audit is the aim of a program developed by, and available to clients of The United States Testing Company, Incorporated, Hoboken, New Jersey.

Such a service is the biological counterpart of the store audits now in use. The company's Bacteriological Quality Coefficient (BQC) is intended to serve as a "yardstick" for measuring the quality of a product and for comparing it with other producers' goods, or with that of goods from the same plant at different times, etc.

Devising a simple measure for fair comparison of foods is difficult. Different foods have their own bacterial requirements. After examining thousands of samples, the company decided that all foods could be evaluated in terms of the following four criteria:

1) microscopic examination of stained specimens;
2) microscopic mold counts;
3) standard bacterial plate counts; and
4) standard mold plate counts.

Counts are taken of viable bacteria, mold fragments and extraneous matter. Rating scale values for each count are taken from a table. Different classes of foods have their own individually weighted tables. The table shown herewith is used for foods which should be sterile. Other foods which do not require sterility are scored from different tables.

The BQC is the sum of the rating numbers, divided by 100, for the three types of counts. The BQC can vary from 0.03 (pretty sad) to 1.00 (very good).

A sample sheet from a report on the hygenic quality of Frozen Green Beans is reproduced. This sheet shows

FOOD HYGIENE CONTROL AUDIT
Food — Green beans (frozen)

State	City	Sample	Manufacturer	Rating scores: Viable Bacteria/Gram	Mold Count	Microscopic Examination	B.Q.C. Bacterial Quality Coefficient
Md.	Silver Spring	6	*	*	*	*	*
		7	581	40	15	15	0.70
Mass.	Boston	1	864	50	15	7	0.72
		2	268	40	15	15	0.70
		3	141	50	15	15	0.80
		4	732	50	15	25	0.90
		5	96	50	15	15	0.80
		6	316	50	25	25	1.00
		7	581	50	5	7	0.62
Mass.	Worcester	1	864	50	15	15	0.80
		2	268	30	15	7	0.52
		3	*	*	*	*	*
		4	732	50	25	25	1.00
		5	96	50	15	25	0.90
		6	316	50	25	25	1.00
		7	581	40	5	7	0.52
Mich.	Detroit	1	864	50	25	25	1.00
		2	268	40	24	7	0.72
		3	141	50	25	25	1.00
		4	732	50	25	25	1.00
		5	96	50	15	15	0.80
		6	316	50	25	15	0.90
		7	581	40	15	7	0.62
Mich.	Grand Rapids	1	864	50	15	25	0.90
		2	268	40	15	7	0.62
		3	141	50	5	25	0.80
		4	732	50	5	25	0.80
		5	96	50	25	25	1.00
		6	316	50	15	25	0.90
		7	581	50	15	7	0.72

*Not marketed in this city

One page *from Report on Frozen Green Beans. Other pages of report cover balance of cities sampled, other manufacturers*

***Technician** examines juice for mold at United States Testing Company*

RATING SCALE VALUES

***Rating scale** used for food which should be sterile. Foods with definite count allowances (milk, meat, etc.) would be rated upon a different scale*

Viable bacteria per gram

1. Sterility	= 50 points
2. 1 - 10	= 40 points
3. 10 - 50	= 30 points
4. 50 - 100	= 20 points
5. 100 - 1000	= 10 points
6. 1000 or more	= 1 point

Microscopic mold count

1. 0-10 fragments per volume unit	= 25 points
2. 10-50 fragments per volume unit	= 15 points
3. 50-100 fragments per volume unit	= 5 points
4. 100 or more fragments per volume unit	= 1 point

Microscopic examination

1. No extraneous material	= 25 points
2. Very slight extraneous material	= 15 points
3. Moderate extraneous material	= 7 points
4. Heavy or vermin extraneous material	= 1 point

Uniformity

...the Persians have a word for it!

Those unfamiliar with ancient Persian may not decipher "*uniformity*", written here in ribbons of tragacanth.

In Persia, where gum tragacanth is still sorted by hand, uniformity sometimes is just a word. At Penick it's always a *fact*. Electroviscometers enable us to make accurate evaluations to meet your specifications consistently.

Precision in quality control, learned through our long experience in the pharmaceutical industry, is typical of the service we provide food processors whether the product is one of our *evenized*® gums or any of a thousand other items. Using the most modern scientific procedures, we have developed unique capabilities in grading and processing the wild, uncultivated produce of nature. Essential values that you need are captured in Penick's standardized, uniform finished products.

We'll gladly furnish any information you want on our broadly diversified line.

To get the best of Nature . . . call PENICK

Spiceal® Flavors
Oleoresins
Extracts and Essential Oils
Vanilla Sugars
Water-Soluble Gums
Papain
and other products derived from Botanicals

S. B. PENICK & COMPANY
100 CHURCH ST., NEW YORK 8
735 W. DIVISION ST., CHICAGO 10

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five of the 100 cities covered. Clients are given completely unrelated code numbers and each client is informed of his number or numbers.

Compared to a program carried out by any individual producer, the following advantages may be claimed:

1) the plan is nation-wide, taking in 100 (or more) cities;

2) pre-tested handling steps insure least product change from time of sample purchase to inspection;

3) equipment and trained staff to handle 2300 samples daily is available to company clients without capital investment or delay for building, training, etc.;

4) the cost, per sample-per city-per month, is under five dollars.

Quality conscious producers interested in this service can get more information by writing to the attention of Mr. H. M. Block, Vice President, United States Testing Company, Incorporated, 1415 Park Avenue, Hoboken, N.J. END

Honey drying process, costs

Producers and users of honey may be interested in Bulletin ARS 73-33 (16 pp) of the Agricultural Research Service of the USDA. Authors Claffey, Turkot and Eskew give specific details of equipment and operating conditions.

They put the cost of producing 1¼ million lb of dried honey per yr at 24c per lb with baker's honey at 13c per lb. Replacing 1/3rd of the honey solids with sugar at 9½c per lb results in a saving of 2c per lb and improves storability.

Bulletin ARS 73-33 is available from the Eastern Regional Research Laboratories, USDA, Philadelphia 19, Pa.

SEE THE CLASSIFIED SECTION

Equipment — Materials — Employment — Business Opportunities—Professional and Technical Services
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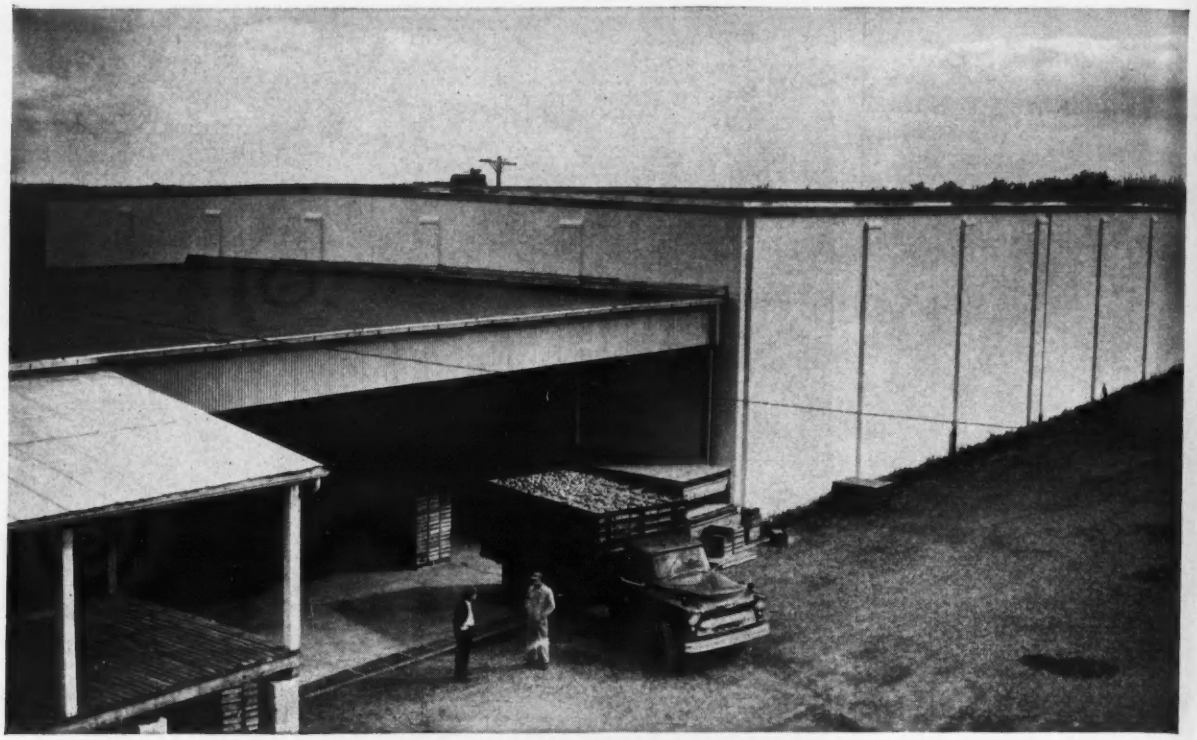
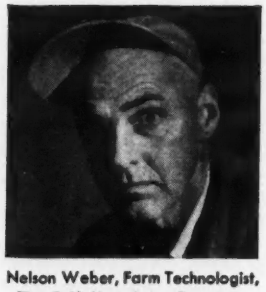


Musselman's new half-million cubic foot warehouse, Arendtsville, Pennsylvania.

STYROFOAM®

"It pays to select STYROFOAM and an Approved Insulation Contractor to install it!"

"Almost 43,000 square feet of Styrofoam insulation board keeps our new cold-storage warehouse at an even 32°F.," says Nelson Weber, Farm Technologist for The C. H. Musselman Company. "Styrofoam gives us an ideal storage environment—a critical matter for apple crops, much of which may have to be stored for several months before marketing."



Nelson Weber, Farm Technologist, The C. H. Musselman Company.

This new half-million cubic foot capacity warehouse at Arendtsville, Pa., is insulated with 4-inch thick Styrofoam, installed by a Dow Approved Insulation Contractor. The general contractor on this warehouse job declares, "Installation of Styrofoam by an AIC pays—we know he'll give us the best possible job because of the experience of his professionally-trained crews. High quality workmanship and a superior product (Styrofoam) add up to a thoroughly satisfactory job—one that's done right!"

Styrofoam—lightweight, rigid insulating material—has a low "K" factor that stays low. Its millions of tiny, non-interconnecting air cells provide high resistance to water and water vapor—water does not penetrate to freeze, swell and crack the insulation. And Styrofoam won't attract vermin, an important consideration in food storage.

The seal above is displayed by Dow Approved Insulation Contractors, chosen by Dow for their experience, business reputation, and high quality workmanship. The AIC takes great care to follow Dow recommendations for installing Styrofoam. For the names of Approved Insulation Contractors near you, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1539BH12.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

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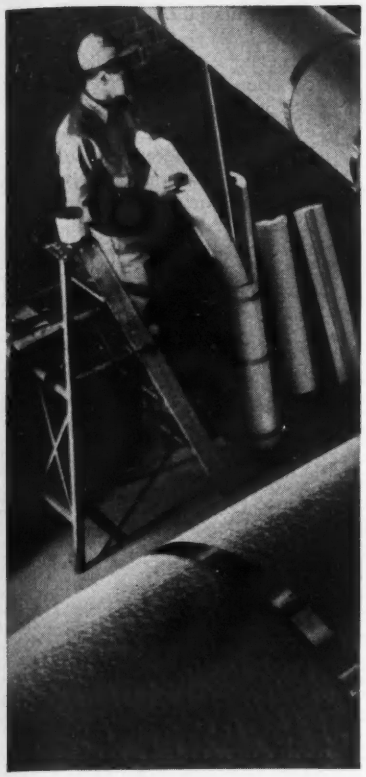

Stops moisture...

STYROFOAM®

for pipe covering insulation

Low-temperature pipe covering made of Styrofoam does an excellent job and requires minimum maintenance. Its unyielding resistance to moisture and its permanent low thermal conductivity prevent condensation and dripping—reduce heat transfer.

Pipe covering made of Styrofoam will not crack or split from thermal shock. Since it does not absorb water, it is not affected by ice build-up around uninsulated valves. It's lightweight and easy to apply. A complete line of pipe and vessel covering made from Styrofoam is available from the following fabricators:

COLUMBIA ASBESTOS CO., Portland, Ore. • ENGINEERED FOAM PLASTICS CORP., Elkhart, Indiana • GLO-BRITE PRODUCTS INC., Chicago, Illinois • KENNEDY INDUSTRIES, Los Angeles, California • KRANSCO MANUFACTURING COMPANY, South San Francisco, California • MMM INCORPORATED, Houston, Texas • ROBINSON INDUSTRIES, Coleman, Michigan • STYRO FABRICATORS, Kansas City, Kansas • STYROFORMICS, INC., Somerville, Mass. • STYROPLASTICS, INCORPORATED, Minneapolis, Minnesota • TUFFLITE PLASTICS, INC., Ballston Spa, New York

DOW

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1 Package Weight Control

Should rejection accuracy of a checkweigher be about 10 per cent of tolerance?

HOWARD P. MILLEVILLE
Editor

BEFORE we can answer the question raised in the heading we ought to clearly define just what is meant by the terms involved.

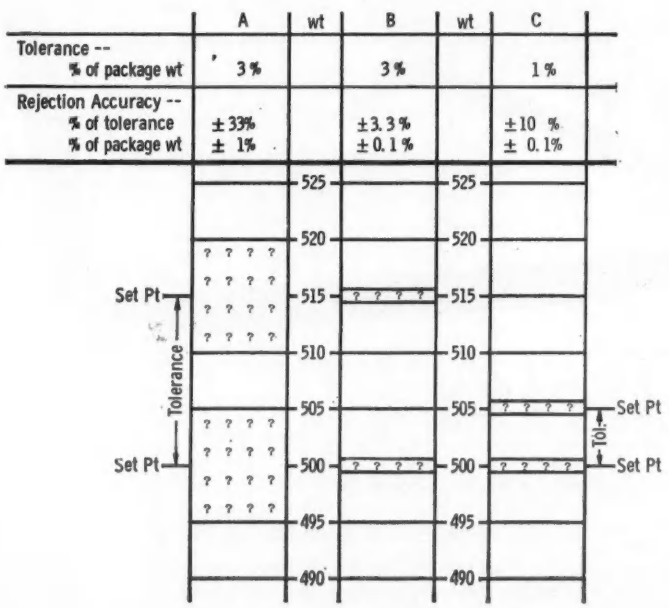
Tolerance is the variation in weight of the product which the packager specifies as acceptable. Thus, if the package weight is to be controlled at 14 ounces plus or minus ¼ ounce, the tolerance is ½ ounce; the tolerance is also ½ ounce if the weight is to be controlled at 14 ounces minus zero ounces to 14 ounces plus ½ ounce.

Rejection accuracy as used by manufacturers of checkweighers is a measure of the sensitivity and repeatability of the weighing mechanism. It is the *precision measure* of the checkweigher's performance and is typically expressed in such terms as plus or minus 0.1% of package weight or plus or minus 1 gram.

Suppose that the package to be weighed is 500 grams (a weight equivalent to about 1 lb 1½ oz since 1 oz equals 28.35 grams), and that acceptable package weights are in the range of 500 to 515 grams, so that the tolerance is 15 grams.

Under these conditions the performance of a checkweigher with a rejection accuracy of first plus or minus 1.0% of package weight and then plus

CHECKWEIGHER PERFORMANCE



you can **TASTE** *the difference when you use*

VICO FLAVOR INGREDIENTS

For soup formulations, casserole mixes, gravy mixes, rice dishes, sauces, and all foods requiring a meat flavor, use

- **VICO BF (Beef Flavor)**
- **VICO Yeast Autolysates**
- **VICO Vegetable Bouillons**

Derived from natural plant proteins, VICO Flavor Ingredients complement and blend perfectly with other ingredients. Available in powder or paste form.

For that tangy element of genuine hickory smoke, use

- **KATER Deep Smoked Yeasts (Brewer's or Torula) for bacon-like flavor**
- **KATER Smoked Bouillon for a dry, soluble, smoked meat flavor**
- **KATER Smoked Autolysate for a liquid smoked meat flavor**

For natural fermentation flavor in baked goods and dry mixes, chemically or yeast leavened, use

- **VICO 400 Types A or B**

VICO craftsmanship in flavor ingredient creation, combined with modern production experience, assures delicate flavors of uniform character and high purity. Let VICO endow your foods with compelling consumer appeal that guarantees repeat sales.

For technical information only, circle Number 6717 on the request card. For specific samples and suggestions, write to

VICO PRODUCTS COMPANY

415 West Scott St., Chicago 10, Ill.
Manufacturing Chemists to the Food and Pharmaceutical Industries

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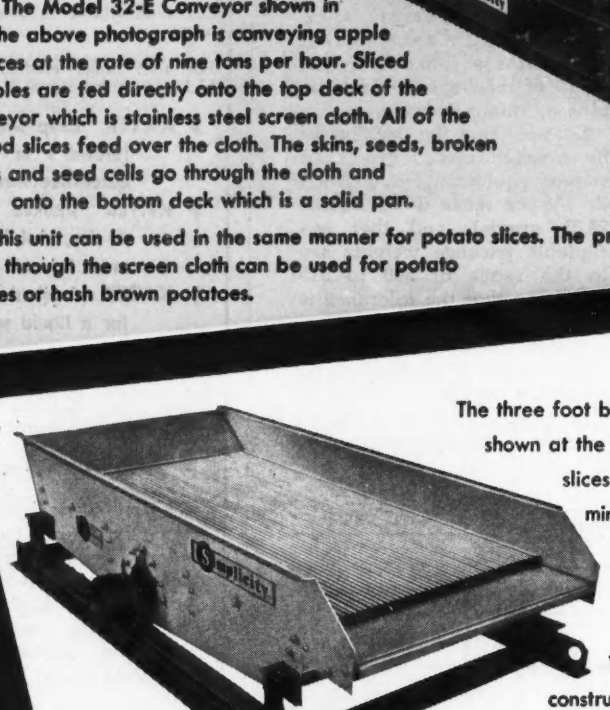
V 21 12 DEC 61 UMI

CONVEY YOUR APPLE OR POTATO SLICES WITH A SIMPLICITY CONVEYOR

CONVEYING EQUIPMENT FOR THE FOOD INDUSTRY

The Model 32-E Conveyor shown in the above photograph is conveying apple slices at the rate of nine tons per hour. Sliced apples are fed directly onto the top deck of the conveyor which is stainless steel screen cloth. All of the good slices feed over the cloth. The skins, seeds, broken slices and seed cells go through the cloth and onto the bottom deck which is a solid pan.

This unit can be used in the same manner for potato slices. The product which goes through the screen cloth can be used for potato patties or hash brown potatoes.



The three foot by six foot Model "C" screen shown at the left handles 600 pounds of apple slices per minute with 600 gallons per minute of brine. Efficiently removes seeds, chips, skins and broken slices. Brine is used for the recovery of seeds.

This unit is of stainless steel construction with a special deck. Openings vary from 5/16" to 3/8" slots.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 6, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U. S. A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario • FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N. Y. 225

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Mettler Inst
P.O. Box 100

Toledo Scal
Telegraph R

New devel
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at the show
described in
on pages 53,

or minus 0.1% of package weight is shown in the columns headed A and B of the diagram.

Note that the rejection accuracy is the weight range in which the acceptance or rejection of a package by the checkweigher is a function of chance. At the midpoint of this range, that is, at the set-point weight, the acceptance-rejection ratio is 50-50. This acceptance-rejection ratio increases to 100-0 as the weight of packages approaches the all-accept weight point, and decreases to 0-100 as the weight of packages approaches the all-reject weight point in accord with the normal probability curve.

Hence, the performance of checkweighers is definitely better than a first glance at the diagram would indicate.

Rejection accuracy typically decreases as the speed of checkweighing is increased. For many checkweighers, this decrease is minimal up to the point where the capabilities of the system are exceeded, e.g. up to the point where the time a package is on the weighing platform is less than a certain minimum.

The minimum degree of rejection accuracy acceptable for good production practice is dependent not on package weight but on the tolerance. The important consideration in this respect is the extent of the "shaded" or chance rejection range in terms of the

CHECKWEIGHERS were exhibited at the Packaging Machinery Manufacturers Institute Show in Detroit last month by:

The Exact Weight Scale Company, 538 E. Town St., Columbus 15, Ohio

FMC Corporation, 4900 Summerdale Ave., Philadelphia, Pa.

Hi-Speed Checkweigher Co., Inc., 605 West St., Ithaca, N.Y.

Illumitronic Systems Corporation, 680 E. Taylor St., Sunnyvale, Calif.

Mettler Instrument Corporation, P.O. Box 100, Princeton, N.J.

Toledo Scale Company, Telegraph Road, Toledo, Ohio

New developments in checkweighers shown for the first time at the show or not previously described in FOOD PROCESSING on pages 53, 54, and 55.

Since Allegheny Ludlum Stainless Steel provides the highest known sanitary protection, it easily meets the exacting requirements imposed on food plants by sanitary inspection laws. The spotless appearance of stainless equipment stresses the hygienic precautions that have to be maintained. Stainless Steel takes the constant rubbing, hosing-down and steam necessary for cleaning and maintenance.

Turn the page for the newest Allegheny Stainless developments for the food processing industry.

3609

These Newest Developments in Applying Stainless Steel Promise Lower Costs

Recent experiments prove lower cost 200-series stainless OK for Dairy Equipment

The dairy farm's current transition from the ten-gallon cans of milk cooling in the spring house, to a modern, refrigerated stainless steel bulk storage tank should gain momentum as the result of a test recently completed at The Pennsylvania State University, and the results should interest all food processors.

An experimental 205-gallon bulk milk tank, fabricated from a more economical, relatively new type of stainless, has proved successful in handling milk during a 3½ year service test at Penn State's milk production center.

Results suggest that Allegheny Ludlum Type 202 Stainless, in which manganese replaces much of the nickel as a component, can handle milk as efficiently and safely as the more expensive grades of stainless from which Penn State's other bulk tanks were made. It can also be cleaned and sanitized easily.

Reports state that the 3½ year old tank "remains in perfect condition, entirely free of pits or corrosion, stains or discoloration. The finish, on both the outside and inside, looks as good as new."

The Type 202 tank has behaved in every respect like Penn State's other tanks, which are made from the famous Type 302—18 percent chromium, 8 percent nickel stainless steel. Washed with a regular alkaline dairy cleaner, the "202" tank received cleaning service identical to the other tanks. Each was also cleaned weekly with a standard organic acid dairy cleaner to remove hard water deposits.

The Type 202 stainless maintained the high quality taste of the milk and did not affect the bacteria count, two of the most important considerations of dairy equipment. Any food processor following the same cleaning procedures should consider the Allegheny Ludlum originated 200-series, Stainless Steels as food for thought.

More local stocks of A-L Stainless

In the past several years, A-L has added additional distributors. For the names of the Steel Service Centers in your location who stock Allegheny Stainless just ask the A-L representative or call the district office.

Sanitation Studies show economical #2B or #3 finish stainless as bacteriologically cleanable as expensive #4 or #7.

Research recently completed at Michigan Agricultural Experiment Station, Michigan State University, concludes—"since there was no significant difference in the bacterial counts of the four finishes, it must be concluded that there is no difference in the relative cleanability of these four finishes and that any of these finishes should be satisfactory for dairy processing equipment from a sanitation standpoint."

By switching to a #2B finish, first costs of a piece of equipment can nearly be halved.

The project was supported in part by the American Iron and Steel Institute and the National Association of Dairy Equipment Manufacturers. A reprint of the study is available from any A-L representative or by writing to headquarters.

The research should be studied by everyone concerned with food processing equipment.

A-L's New Research Center offers assistance on any of your problems

Consolidated in one center is all of A-L's research personnel, probably the largest group in the specialty steel industry. The vast experience and knowledge of the pioneer producer of stainless steel is at your service.

ALLEGHENY LUDLUM

tolerance range.

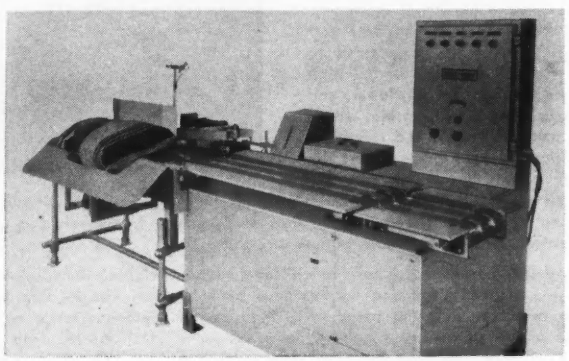
Obviously, the tolerance should be one which is readily obtainable by the filling operation; otherwise one is not properly specifying the weight control function.

Column C of the diagram depicts the performance of a checkweigher when the tolerance is 1% of package weight and the rejection accuracy is plus or minus 10% of the tolerance, which in this case is therefore plus or minus 0.1% of package weight. It shows what is presently considered about optimum performance for checkweighing a production filling operation *where the tolerance is 1% of the package weight.*

In terms of weights for the example considered, this optimum performance corresponds

continued on page 59

Package Weight Control



Bag is shown being rejected by an air-operated pusher off correct weight channel. Other reject arrangements available

Checkweighs bags, cases — 25 to 150 lbs

BAGS AND CASES are weighed in motion in an uninterrupted flow. Checkweigher automatically classifies and records weight of filled bags and cases weighing from 25 lbs to 150 lbs.

For bags, rates up to 25 per minute; for cases, up to 40 per minute. Rejection accuracy at maximum speed is 1/10 of 1 per cent of package weight.

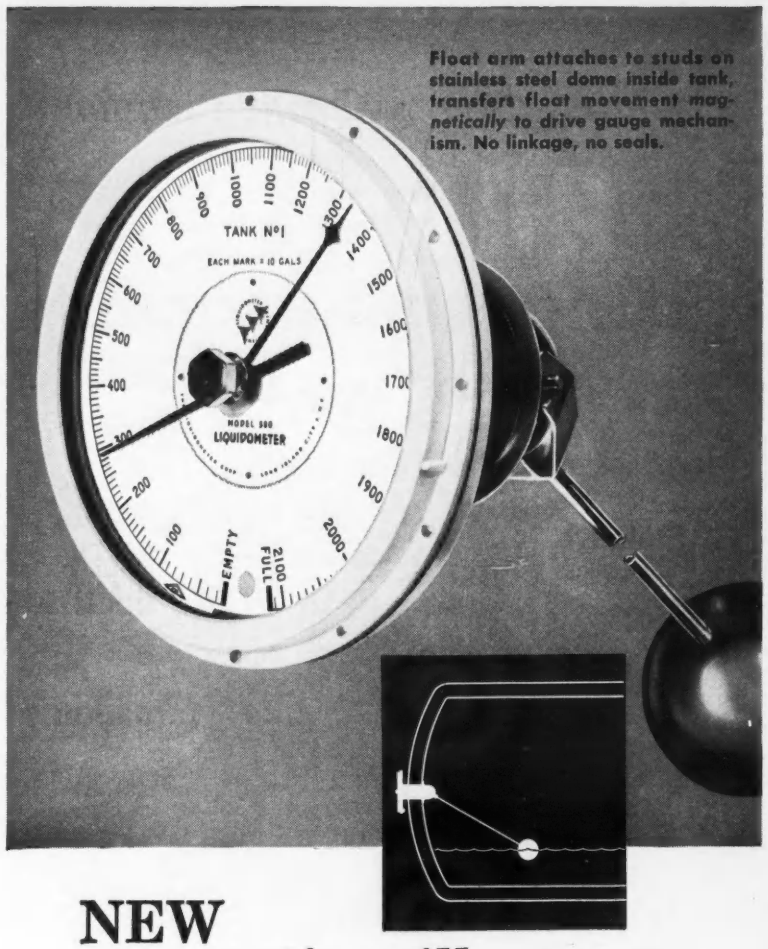
Photo shows new air-operated reject section smoothly pushing reject bag clear of machine to front; rejects can be pushed to rear if desired. Correct weights continue on in a straight line.

Another type reject system for 50-100 pound bags has "pop-up" conveyor belts in the discharge section. When a reject bag moves onto the reject section, belts which are submerged below the roller conveyor section pop up and reject the bag off the back of the machine to another conveyor if underweight, or off the front of the machine to a conveyor if overweight.

When complete rejection of an item is not required, but indication is desirable, this checkweigher can be equipped with devices to mark over and underweight cases and bags or to drop colored metal plates on items of incorrect weight.

This automatic bag and case checkweigher is designated as Selectrol Model 1250 by the manufacturer: The Exact Weight Scale Company, 538 E. Town Street, Columbus, Ohio.

6719 on Reader Service Slip.


Float arm attaches to studs on stainless steel dome inside tank, transfers float movement magnetically to drive gauge mechanism. No linkage, no seals.
TANK No1
EACH MARK = 10 GALS
MODEL 580
LIQUIDOMETER
EMPTY
FULL
2100

NEW automatic milk gauge— at new low price

Liquidometer dial-type model is easy to read, easy to clean, completely dependable. And volumetric indications are unaffected by liquids of different densities.

All sanitary requirements are met by the Liquidometer Model 580 Milk Gauge. Stainless steel construction of "inside tank" surfaces—including removable float arm—assures fast, easy, thorough hand or CIP spray cleaning. Magnetic coupling of float arm to precision drive mechanism eliminates the need for electricity or compressed air. Eye-level, clock-style indicator is easy to read . . . features an adjustable check pointer. Indicator housing is completely waterproof. And, due to new manufacturing techniques, the Model 580 automatic milk gauge costs less than previous models.

Liquidometer Bulletin 833 contains complete information. Write for your copy today.

THE LIQUIDOMETER CORP.

Dept. G, LONG ISLAND CITY 1, NEW YORK

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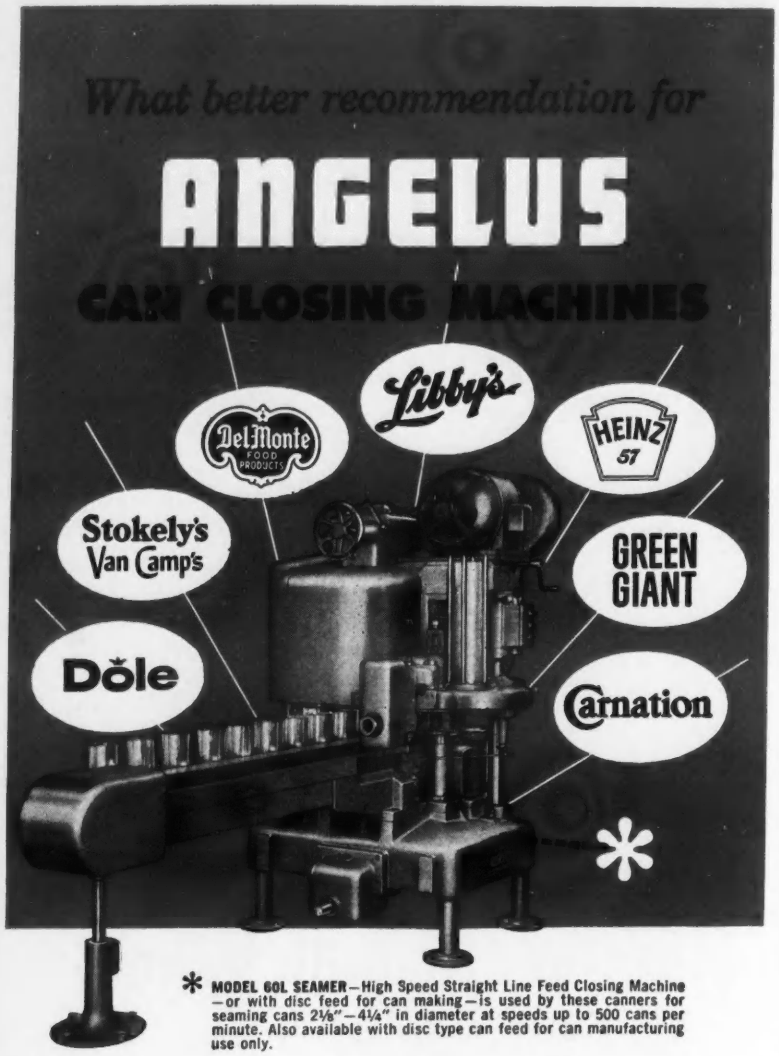

* MODEL 60L SEAMER—High Speed Straight Line Feed Closing Machine—or with disc feed for can making—is used by these canners for seaming cans 2⅛"—4¼" in diameter at speeds up to 500 cans per minute. Also available with disc type can feed for can manufacturing use only.

Canners and can makers the world over need...even demand the ultimate in simplified, rugged, efficient design. These demands are met by Angelus...the nation's only manufacturer exclusively producing automatic can closing machines.

Angelus seamers, backed by over 45 years of experience, are rugged and dependable; they are simple to operate and maintain; they represent the lowest possible initial investment.

WRITE TODAY for complete details. Specify products, can dimensions and your capacity requirements.

ANGELUS
Sanitary Can Machine Company

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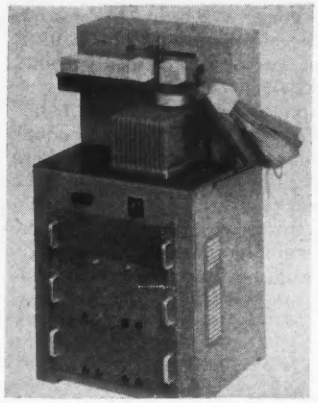

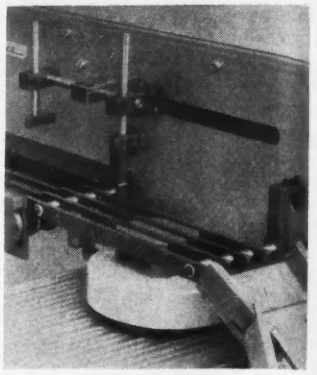

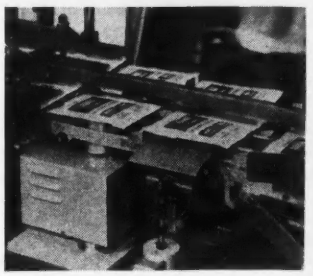

Above left: arrow points to separate weighing unit mounted above cabinet housing electrical system

Above right: close-up of transport system. Packages are transferred to and off weigh pan in the following sequence: (1) pusher arm lowers and pushes package onto grate above weigh pan, then raises and returns to initial position; (2) grate lowers depositing package on weigh pan; (3) after 0.4 second to 1.8 second on weigh pan (time is adjustable) when weight is sensed by control system, grate raises and package just weighed is pushed off grate as another package is pushed on

Right: In this close-up of a production line for checkweighing dehydrated soup packages, two checkweighing systems have been installed side by side for obtaining twice the weighing speed of a single system. Packages are transported on and off weigh pan by a walking beam system in which intermeshing grates move up (picking up a package), forward, and then down (depositing package on another grate), and then back to initial position to repeat cycle

Plus or minus 0.020 grams is rejection accuracy of checkweigher

FOR CHECKWEIGHING in the very low weight ranges, Mettler Instrument Corporation offers a line of checkweighers. Two of these have rejection accuracy of plus or minus 0.020 grams. One of these has a capacity of 10 grams; the other, a capacity of 30 grams (1 oz = 28.35 g).

Two other instruments in their line have a rejection accuracy of plus or minus 0.2 gram. One of these has a capacity of 100 grams; the other has a capacity of 300 grams.

As shown in the illustrations, the checkweigher consists of a modular weighing unit and pan, and an electrical control system housed in a separate cabinet. Packages to be checkweighed are transported to the pan, weighed, then transported off pan to accepted or reject channels.

Rates depend on feed and sorting speeds of the auxiliary transport systems and vary from 40 to 90 per minute. Two types of transport systems are described in the illustrations.

This line of checkweighers ranging in capacity from 1 gram (rejection accuracy of plus or minus 0.002 gram) to 1000 grams (rejection accuracy of plus or minus 2 grams) is described in Bulletin 101A of the Mettler Instrument Corporation, P.O. Box 100, Princeton, N.J.

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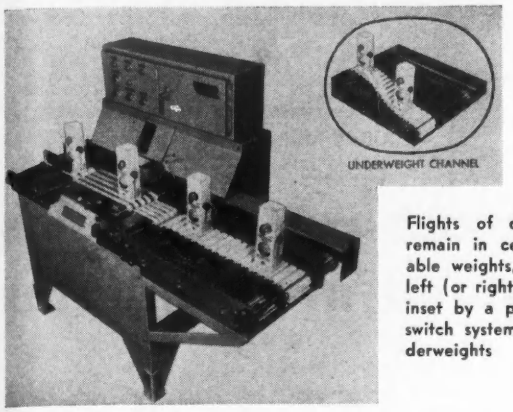


Flights of discharge section remain in center for acceptable weights, are diverted to left (or right) as shown in the inset by a pneumatic electric switch system for over or underweights

Diverts open containers without spillage

FOR smoother rejection of packages weighing up to 5 pounds, the discharge section of Model 1206 Selectrol checkweigher has been modified. Plastic flights on an endless crossbar belt are directed laterally to either side as the conveyor moves forward to reject packages as shown in the photos.

The diverting action is smooth without jerks so that open, filled containers are directed to reject conveyor lines without spillage.

Rejection accuracy is 2/10 of 1 per cent of the package weight at maximum speed of 150 per minute.

More detailed information available from The Exact Weight Scale Company, 538 E. Town Street, Columbus 15, Ohio.

6724 on Reader Service Slip.

Checkweighs canned foods at 120 per minute

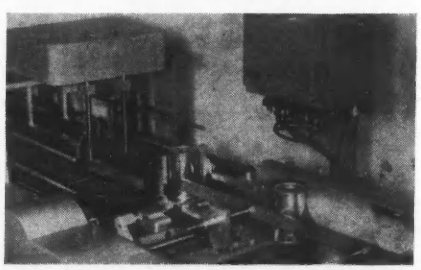
CANS from 211 to 404 up to 2 lbs are checkweighed and sorted automatically at speeds to 120 per minute.

Rejection accuracy of 1½ grams on weights to 2 lbs.

Two discharge lanes are provided when over and under weights are to be rejected to a common lane. To provide separate lanes for under and over and acceptable weights, a three lane discharge section is used.

Data Sheet 61-8, describing this Model CW-1 is available from the Hi-Speed Checkweigher Co., Inc., 605 W. State St., Ithaca, N.Y.

6725 on Reader Service Slip.



Arrow at left points to can leaving scale section; arrow at right points to can just entering scale section. Proper spacing is achieved by a timing screw. Note that the electrical control system is mounted above the conveyor level on a separate pedestal in a NEMA 12 enclosure

important notice to the food industry

As part of our expansion program, we are pleased to announce the change in our corporate name

from

E. F. DREW & CO., INC.

to

DREW CHEMICAL CORPORATION

To keep pace with the changing technology of today's food industry, we are now placing greater emphasis on the development of food emulsifiers and other nutritive specialties.

FOOD PRODUCTS DIVISION

DREW CHEMICAL CORPORATION

15 EAST 26TH STREET • NEW YORK 10, NEW YORK

FORMERLY E. F. DREW & CO., INC.

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DUPLICATE BATCHING OPERATIONS

WITH THE NEW NIAGARA ELECTRIVOLUME METER

Brings automation to liquid processing. Set the pointer to the quantity of liquid desired and push the button. The meter takes over from there. It automatically measures and delivers the preset quantity, when the flow has stopped it resets the quantity, ready to duplicate the delivery cycle when the starting button is again pressed. It's as simple as that!

To change the quantity for a new formula, just turn the pointer to the gallonage called for and the meter is ready. Should an emergency arise, a stop switch is provided to shut off the flow at any point in the delivery cycle.

The Niagara Electrivolume Meter can be used to start or stop pumps, operate solenoid valves, signalling devices, electric relays and other processing equipment to make the meter the master control center for a complete series of operations. It can be used to actuate other Electrivolume Meters to automatically deliver other liquids in any desired sequence. There is virtually no limit to the extent which the Electrivolume Meter can be used to initiate and control process cycles.

If you formulate liquid components, the Electrivolume Meter will assure complete uniformity of product at lower costs. Write for complete information.

BUFFALO METER COMPANY, INC.

Subsidiary of American Meter Company

2912 MAIN STREET • BUFFALO 14, N.Y.

Sales representatives throughout the nation

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Saves customers thousands yearly, Allied Mills uses computer to get —

Minimum cost formulas figured in 3 minutes

THE ANIMAL feed industry is highly competitive. It is marked by prices, inventory limitations and quality specifications that fluctuate widely. Perhaps even more than many businesses, accurate prices and lowest costs are vital to it.

Allied Mills, Inc. of Chicago handles an average of about 1000 feed orders daily. These involve an estimated 1400 different combinations made in 12 mills. The feeds are sold by over 5000 dealers serving the eastern and mid-western U.S.

Feed mills blend ingredients into mixes to meet definite analyses. It is possible to meet any one of most analyses by a multitude of combinations of given ingredients. However, at given ingredient costs and analyses, only one combination is the least-cost formula.

To calculate a mix with new requirements differing from existing feeds used to take about 40 man-hours of tables, arithmetic, slide-rule and mechanical calculators.

Then, when ingredient analyses or costs changed, approximation methods were used to get new formulas and prices within a practical time. This took from a few mintues to several hours, depending on the nature of the factors changed and the number and extent of the changes. And, because approximate methods were used, the revised formulas were never *quite* least-cost.

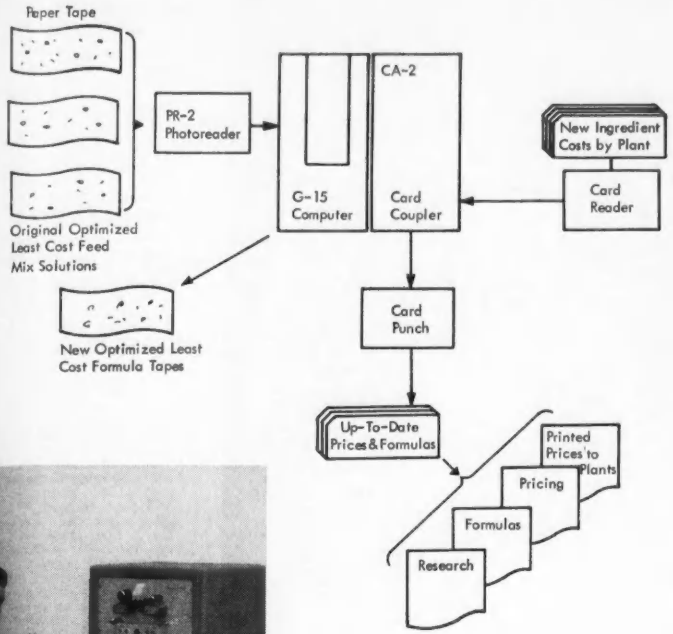
All this is past now. A highly effective linear program carried out by a general purpose digital computer allows the analysis of hundreds of feed combinations not feasible by manual methods. The entire list of feeds can be revised at will.

A computer does the original 40 man-hour job in less than 2 hours. Up-dating the formula takes an average of 3 minutes instead of possibly hours. All this, with an assurance of least cost and freedom from computational errors.

A flow-diagram of the method of calculation is shown. The computer, using paper tape and a high-speed photoelectric paper tape reader, in conjunction with punched cards, a card reader and card coupling unit, makes speedy calculations possible.

The computer makes use of "experience". It uses previously-figured recipes, on paper tape, to start when up-dating formulations. This saves time by avoiding much needless repetition of recorded calculations.

Least-cost formulations and



Flow diagram of computer installation at Allied Mills, Inc. The computing element of the installation, a Bendix G-15 Alphanumeric Digital Computer, accepts input data — new prices and analyses of ingredients — from a Bendix CA-2 Punched Card Coupler scanning appropriate cards.

Using an optimized least-cost mix formula on paper tape (whenever possible), a PR-2 Tape Reader passes this "experience" to the computer. From this information, the computer puts out a new, optimized least-cost formula on paper tape. Then, through the Card Coupler acting via a card punch, the pricing and mixing information is punched onto cards for use by the plants.

Allied Mills, Inc. computer installation. Mr. L. C. Abell, Manager of the Data Processing Dept. is shown at the keyboard of the G-15 Computer's Typewriter Console. At far left is the CA-2 Card Coupler and on the desk is the Pr-2 High Speed Tape Reader

pricing information are recalculated on a weekly, routine basis. Moreover, the computer can prepare valuable management aids, such as a weekly Sales Analysis Report from information furnished by each of the 12 plants.

Among the features of the computer installation are:

1) the price of an ingredient for a given locale need be entered into the computer "memory" only once for any formulations involving that ingredient and locale;

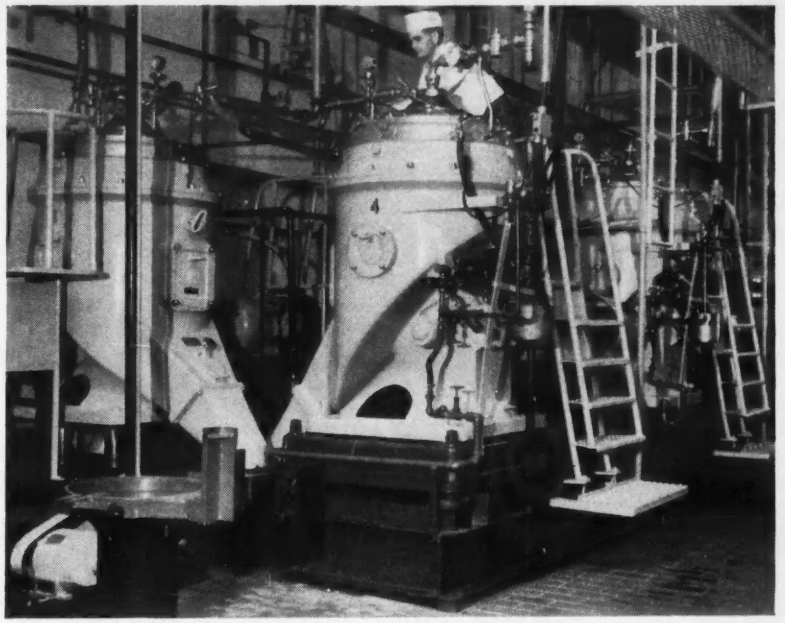
2) the accumulation of rounding-off errors is avoided by a special data-handling technique;

3) one variable only is needed for setting up minimum ingredient restrictions because the computer is able to generate a feasible starting solution;

4) the input and output data are checked at every step to insure accuracy.

Mr. L. C. Abell, Manager of

The computer installation described in this article was engineered by The Bendix Corporation, Bendix Computer Division, 5630 Arbor Vitae St., Los Angeles, California
6728 on Reader Service Slip.



How to spin more profits out of liquid-solid mixtures

Keep the liquid. Keep the solid. Either way, you'll get more *usable* product out of mixtures with the Pfaudler® Titan Superjector.

Case in point 1: An orange juice packer found that heavy finishing left undesirable pulp ingredients in the juice. Light finishing alone meant lost juice in the wet sludge.

So he installed a new procedure, using four of these Pfaudler centrifuges. Now he countercurrent-washes the pulp from a light finishing and centrifuges out unwanted particles. He gets the high quality of a single light finish *without* sacrifice in yield.

Case in point 2: A Canadian firm producing animal feed from spent grains installed a Titan to recover fines from their presswater. Result? Output of dried grain was increased with no increase in cost of raw materials. And protein content was improved to a guaranteed minimum of 30% by weight.

Best of all, this entire new system for protein fines recovery — including the centrifuge—will be paid off in 2½ years.

High separating power. The Titan gives you up to 7500 times gravity. With this power, separations are possible where the difference in specific gravity between solids and liquids is as little as 2%.

Choice of discharge. A Titan exclusive—"Select-eject" control — lets you instantaneously purge the entire bowl, bleed off solids only, or sequence these two effects as desired.

Continuous operation. The Titan has *no* nozzles to clog, no filters to blind. Instead you have automatic discharge through slots ⅜" high x 5" long, which lets you operate continuously.

Versatile. You can concentrate solids to any desired dryness up to 100% by volume, or 20 to 40% by dry weight. You can remove up to 99% of solids to get a clarified effluent with as little as 0.01% solids. You can separate two liquids and a solid, solids only slightly heavier than liquids, liquids that are viscous or aerated, particles that are fine, slimy or abrasive.

And you can do all this on a *production* basis, since the Titan gives you a capacity of up to 6000 gallons per hour.

Free bulletin. For more facts, ask for Bulletin 1002. Write to: Pfaudler Division, Dept. FP-121, Rochester 3, New York. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

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Fourteen years ago Morton Salt stopped worrying about hydraulic oil performance

Harlen Bufka, assistant mill foreman (center) and American Oil's Norm Pagels, review specifications of AMERICAN Industrial Oil. Oil has been used for 14 years in hydraulic press that forms salt blocks under 800-850 tons pressure.

by N. M. PAGELS
About the Author

For 17 years "Norm" Pagels has been providing industrial customers with technical assistance on lubrication problems. His qualifications for this assignment include a degree in chemistry from the Central Michigan University and the completion of his company's Sales Engineering School.

☆ ☆ ☆

Back in 1946, Morton Salt Company installed a 1,000 ton press for forming salt blocks in their Manistee, Michigan, plant. They ran the press briefly with a break-in oil as the hydraulic medium. In 1947, they added our industrial oil to the reservoir. Worries stopped then.

There has never been a complete oil change. Only make-up oil has been added to the reservoir since the initial fill. There has never been any hydraulic pump trouble or a failure of any kind due to the oil. Annually, we take a sample of the oil for analysis by our Technical Service laboratory (at our expense). The oil continues in excellent condition. Morton Salt plant management reports that it (1) holds viscosity (2) resists oxidation (3) lubricates effectively, minimizing wear (4) exhibits excellent demulsibility and (5) is notably resistant to foaming.

☆ ☆ ☆

Would you like to have the trouble-free performance from an oil that AMERICAN® Industrial Oil provides? Call your nearby American Oil office.

Quick facts about
AMERICAN® Industrial Oil

- Antioxidant gives oil resistance to chemical change, minimizes deposits.
- Inhibitor "plates out" on metal surfaces, prevents corrosion.
- Receives special refining to minimize emulsion problems. Contains additive to minimize foaming.
- High viscosity index. Resists temperature change.

AMERICAN OIL COMPANY

AMERICAN

910 SOUTH MICHIGAN AVENUE
CHICAGO 80, ILLINOIS

plants, companies, personalities

General Foods

has promoted William H. Enzie to the newly created position of manager, packaging development and procurement services. The organization change merges the corporate packaging development department headed by Enzie since 1959, with that function of the corporate purchasing department dealing with packaging procurement.

The Borden Co.

has opened an $840,000 powdered milk packaging plant in Mallow, Ireland, 17 mi north of Cork City. The plant will process and package whole milk powder in tins, exclusively for export. Borden's also operates similar plants in Holland and Denmark. Frank V. Forrestal is managing director of the Irish operation, known as The Borden Co., Ltd.

Corn Products Company

announces that nutritionists from India, Mexico and the Philippines have been selected as the first holders of Corn Products fellowships at the Columbia University Institute of Nutrition Sciences, the Institute is directed by Dr. Henry Sebrell, Jr., former director of the National Institutes of Health.

Seeman Brothers, Inc.

announces that its recently acquired subsidiary, Southern Frozen Food Co., has built at Montezuma, Ga., what it describes as the largest frozen vegetable plant in the South. Another Seeman subsidiary, Francis H. Leggett & Co., has begun fruit canning and freezing operations in a recently acquired Sodus, N.Y., plant formerly operated by Silver Shore Cooperative, Inc.

For more information on product at left, circle 6730 see information request blank opposite last page.

Allied Mills' Data Processing Department, in Chicago, estimates that the use of the computer installation saves their customers thousands of dollars yearly.

Many desirable analyses can be carried out on the computer and the results are available while they are still timely. Manual methods in the past often presented such reports when they had become of historic interest only. END

Package Weight Control

continued from page 53

to (a) a tolerance of 5 grams for a 1 lb, 1½ oz package and a rejection accuracy of plus or minus ½ gram.

Other specific weight examples of such optimum performance are : (b) a tolerance of 1 gram for a 3½ oz package and a rejection accuracy of plus or minus 0.1 gram; (c) a tolerance of 1/3 oz or 10 grams for a 2 lb package and a rejection accuracy of plus or minus 1 gram.

As a general rule, or at least as a first approach to considering specifications for a production checkweighing operation it would appear that the rejection accuracy ought to be plus or minus about 10 to 20 per cent of the tolerance. END

Industrial gases data booklet

A 48-page leatherette-bound booklet, ADE-890, describes thirteen common gases in terms of important physical and chemical properties. Oxygen, nitrogen, carbon dioxide and nitrous oxide are included.

In addition to the gases' properties, the charts, diagrams, volumetric data and miscellaneous physical constants included are almost certain to make the little volume useful to anyone handling gases.

The booklet is available from Air Reduction Sales Company, a division of Air Reduction Company, Inc., New York 17, N.Y.

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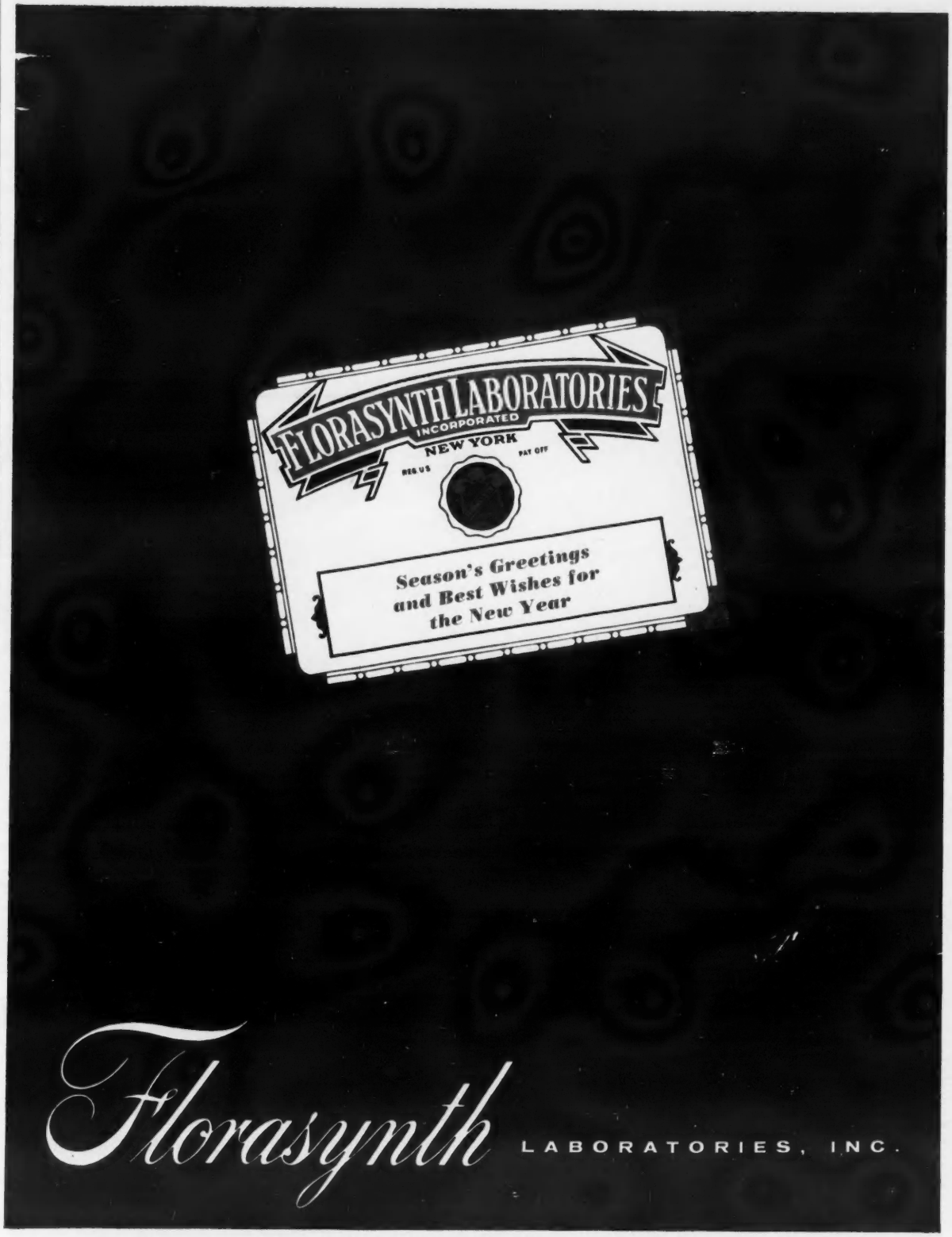

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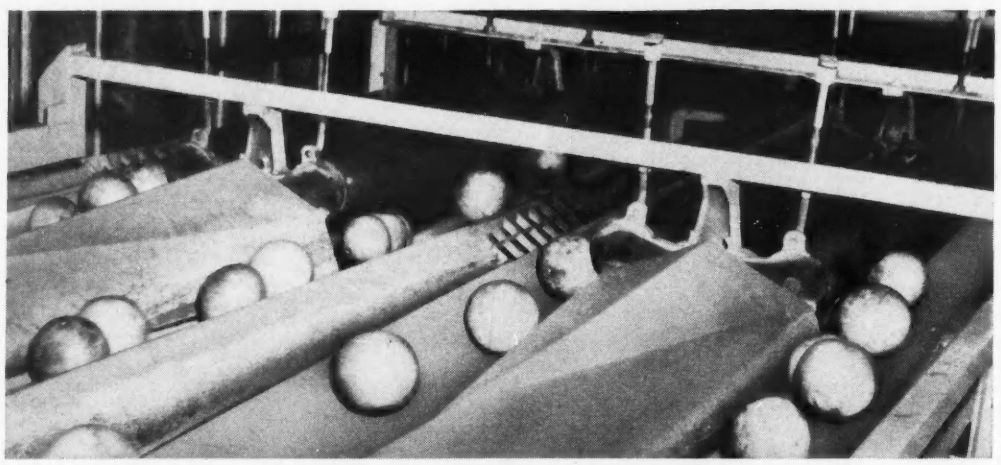
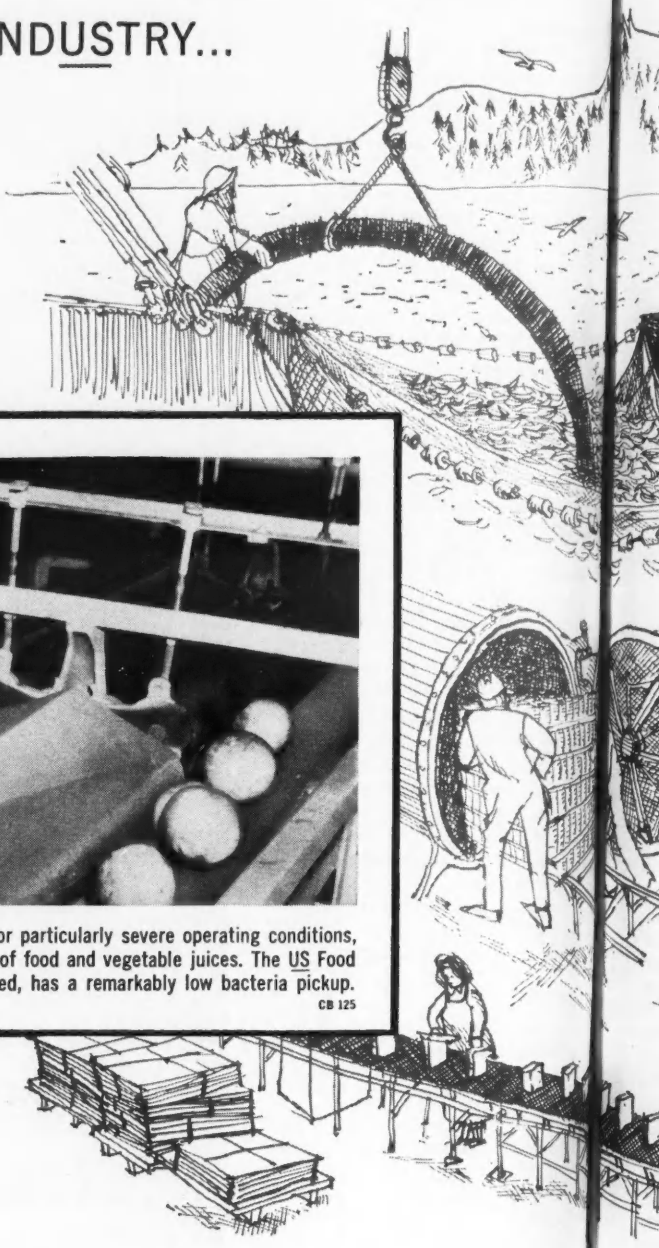
US AT THE HEART OF INDUSTRY...

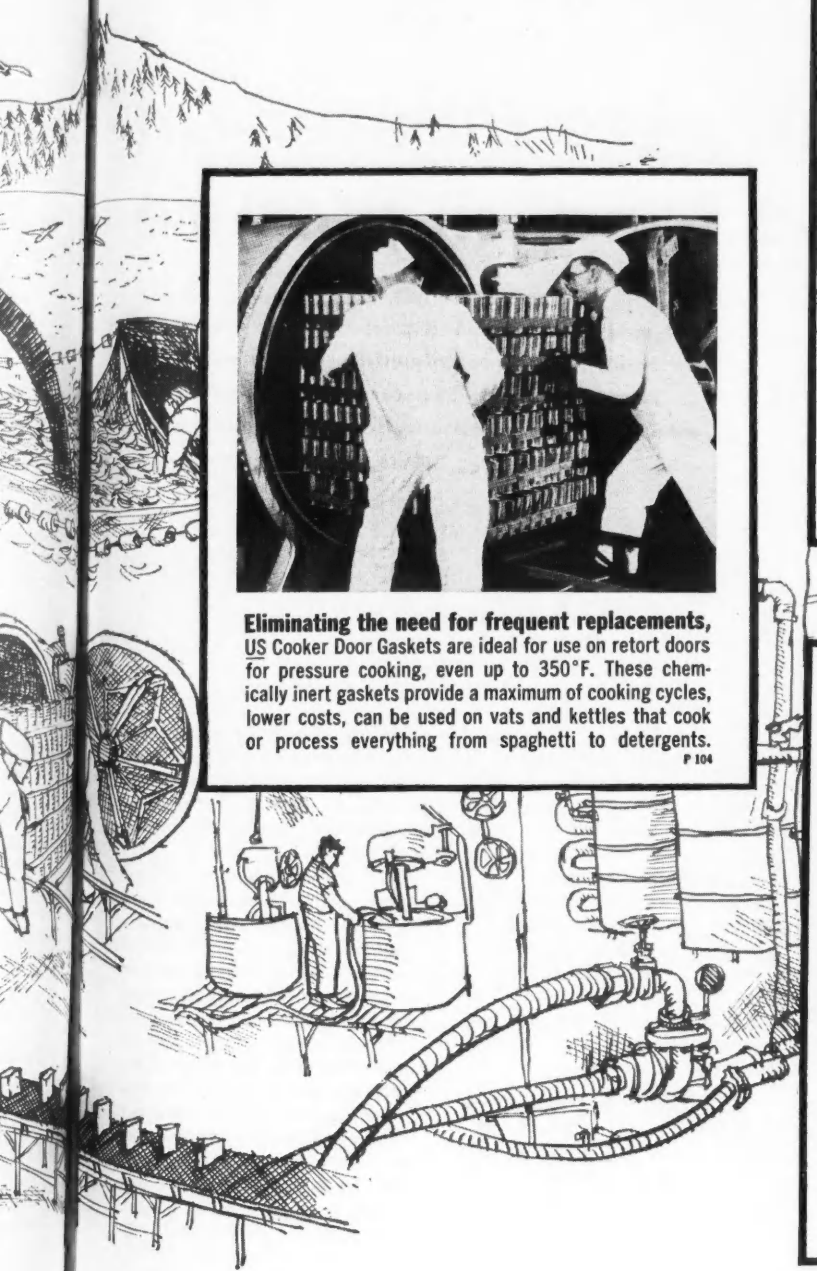


Conveying raw, packed or canned foods, the US Food Belt is built for particularly severe operating conditions, combines high physical strength with resistance to the destructive action of food and vegetable juices. The US Food Belt is easy to clean, does not impart taste to the food being conveyed, has a remarkably low bacteria pickup.

CB 125

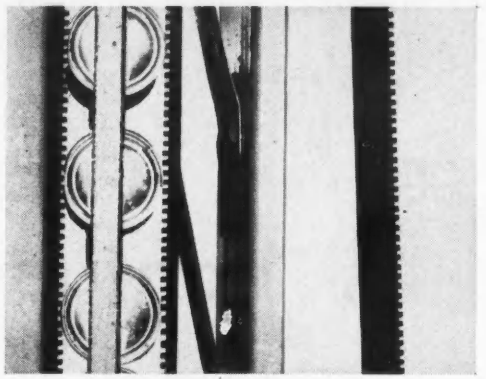


Wherever the processing of foods is involved, US Industrial Rubber Products are helping to make it faster, more efficient, less costly... more profitable. US not only knows the food industry's requirements, but has the products to fill them.



Eliminating the need for frequent replacements, US Cooker Door Gaskets are ideal for use on retort doors for pressure cooking, even up to 350°F. These chemically inert gaskets provide a maximum of cooking cycles, lower costs, can be used on vats and kettles that cook or process everything from spaghetti to detergents.

P 104



"Nothing short of spectacular," says an Anheuser-Busch brewery manager about two U. S. SteepGrade Conveyor Belts that lift wet 16-oz. beer cans at a 90° angle. The secret of this non-slip operation is SteepGrade's "gripper cleat" construction which holds the cans firmly, yet gently, allows less pressure and belt speed, eliminates damage to cans and smearing of print.

CB 124

"Helping to cut shipping and processing costs considerably, our Little Giant® Conveyor Belt has behaved perfectly in 4 years of service carrying franks from the peeling machine to packing personnel," says the superintendent of Wilson's Albert Lea plant. "No repairs have been needed, the belt is easy to clean, needs minimum maintenance."

CB 126

For every industrial rubber product need, turn to US. For Conveyor Belts, V-Belts, the original PowerGrip "Timing"® Belt, Flexible Couplings, Mountings, Fenders, Hose and Packings . . . custom-designed rubber products of every description. Discover why U.S. Rubber has become the largest developer and producer of industrial rubber products in the world. See your U.S. Rubber Distributor or contact US directly at Rockefeller Center, New York 20, N. Y.

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

United States Rubber

MECHANICAL GOODS DIVISION

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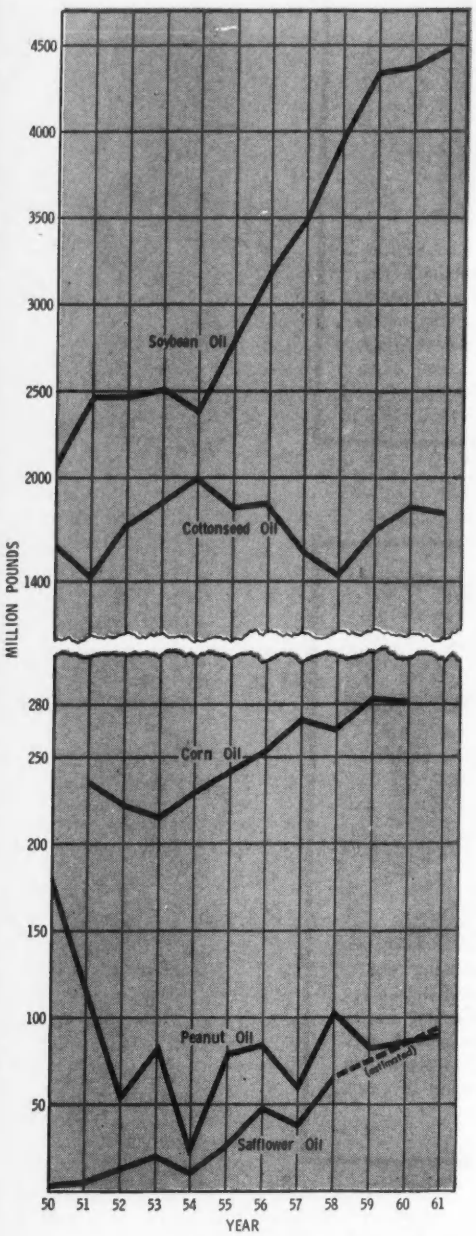


Production *of domestic oils (millions of pounds). Chart shows total domestic amounts available. Note relative uniformity of corn oil and cottonseed oil, which are by-products of other commodities. Safflower rate of growth has been around 30% per year, has probably passed peanut oil to become No. 4 on list of major food oils*

Focus gets clearer on confused food oil picture

A new supply-demand-price structure is evolving from: The rush to polyunsaturates; a supply unrelated to demand for corn and cottonseed oils; and strict quality or marketing commitments which limits switching among oils.

KARL ROBE, Associate Editor

DURING THE PAST few months, the rush to get aboard the polyunsaturate bandwagon has become a stampede, and some processors are getting caught in a cost squeeze.

This rush has culminated from several cumulative years of favorable publicity about polyunsaturated oils.

Each week new products containing higher and higher amounts of polyunsaturated oils are finding space on shelves in grocery sections. Formerly, a few such products fought for space on dietary shelves.

Complete lines of salad dressings, mayonnaise, margarine, even bread and rolls are advising their customers by means of labels, shelf talkers and ads that they contain polyunsaturated oils.

This current rush toward polyunsaturates means that processors are facing a critical change in price and demand structures for their oil raw product supplies.

Just how will this trend affect users of food fats and oils in the future? What is the supply-demand picture for the major food oils in the coming years?

Ordinarily, as demand jumps, supply will also increase sometime thereafter. In the food oil supply line, this is not necessarily so; for 2 of the 3 major food oils, supply is unrelated to demand. And supply of Soya, the other major oil, is related to oil demand to only a minor extent.

Thus, a major shift in demand, such as we now see toward polyunsaturates, upsets an already complicated commodity structure.

• **Corn and cottonseed oil supplies:** Both oils are by-products, so that their supply is tied to the output of a commodity independent of the oil use.

For instance, corn oil *supply* is relatively inelastic to new demands, since it is a by-product of cornstarch industry.

Yet so many companies have recently committed themselves to corn oil in their product line and advertising that the price recently was at an all-time high of 30¢/lb (salad grade, midwest delivery).

Demand for cornstarch is fairly stable. It's big demand is in paperboard where it is used for adhesives and sizing; next use is for sizing garments, followed by food uses (used as starch for thickening, as well as for corn making syrups and sugars).

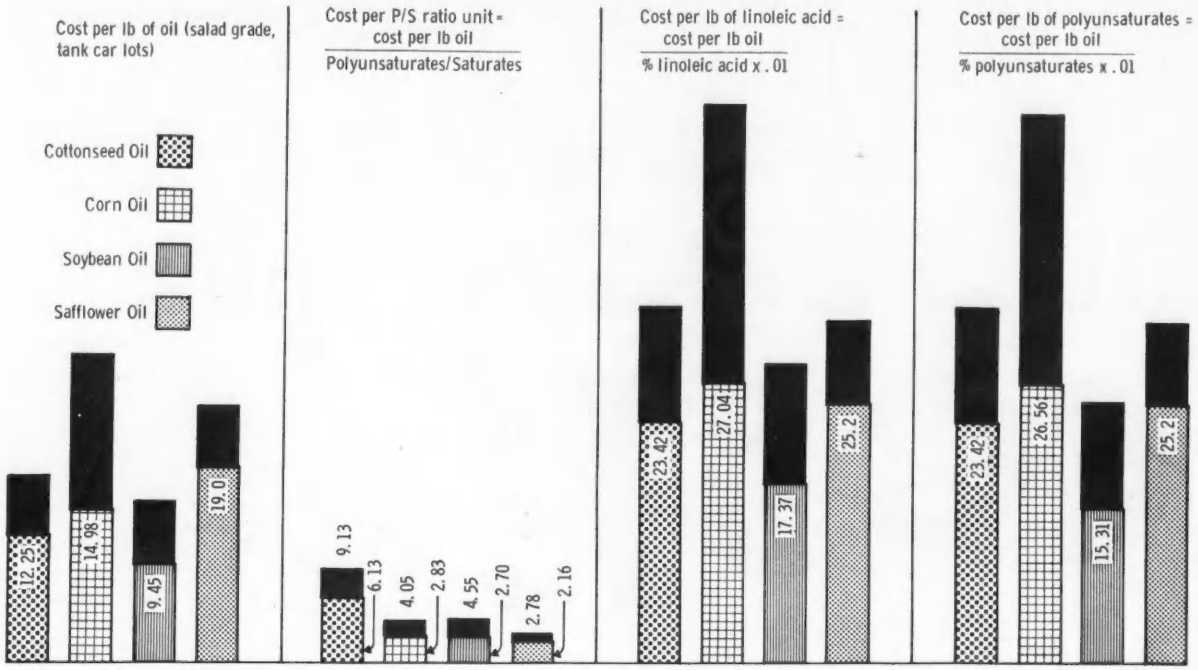
Demand for cornstarch (and supply of corn oil) will tend to rise with increased population. It also tends to follow business cycles, as more or less paperboard and garments are purchased.

Total sales of corn starch are trending upward. Two factors tend to depress this trend: 1. Resins are capturing a share of the fibreboard sizing market. 2. With rise of wash-and-wear garments, less starch is used.

Cornstarch is unlikely to become the by-product. Corn oil price would have to almost double to make oil the principal reason for milling corn.

Therefore, to increase supply of corn oil, new outlets must be found for cornstarch. This is not an overnight achievement, so price pressure on corn oil can be expected to continue for months, perhaps years.

The only relief in this current pressure on corn oil is use of alternate oils. This has its complications, but a chang-



***These tables** illustrate price relationships among vegetable oils on straight cost per lb. (left), and on three bases of cost per unit of polyunsaturates. Black and white portion of bars gives low price, and colored portion gives highest price of each oil between Jan. 1960 and Nov. 1961*

ing tide is already evident.

• **Cottonseed oil supplies:** Focusing now on cottonseed oil, we find that the reservoir of supply is larger than that for corn oil (see graph). With more oil available, price pressure is less.

Nevertheless, the same general trend toward polyunsaturates operates as with corn oil, and the same static supply situation faces users.

Sales of cotton fiber are tied to the rising population curve and also tend to follow business cycles (though government controls on both cotton and corn also influence prices).

Business cycles for cotton fiber frequently do not follow general cycles. Cotton exports, for instance, were 6½ million bales last year, may go as low as 5½ million this year.

With the supply of both oils "captive," prices will continue to receive upward pressure, even though cottonseed oil prices have temporarily receded during the current fixation for corn oil.

Therefore, we turn to soybean oil for possible price relief.

• **Soy bean oil supply/demand:** Soy bean meal accounts for some 80% of soy bean usage. If soy oil prices suddenly spurted, new acreage could be planted to meet the supply. This theory sounds simple, but is much more complex in reality.

For every additional ton of oil produced, the economy has to absorb four more tons of soy bean meal. This excess production drives down soy meal prices, so that somewhere a point is reached where added acreage decreases net profit to the grower.

Crop controls superimpose additional complications, and Government purchases of soya meal products for the Food For Peace project also affect the oil/meal relationship.

Thus it can be seen that soy oil *supply* is not directly related to soy oil demand. Turning now from supply, let's see how the rush to polyunsaturates could affect soy oil *demand.*

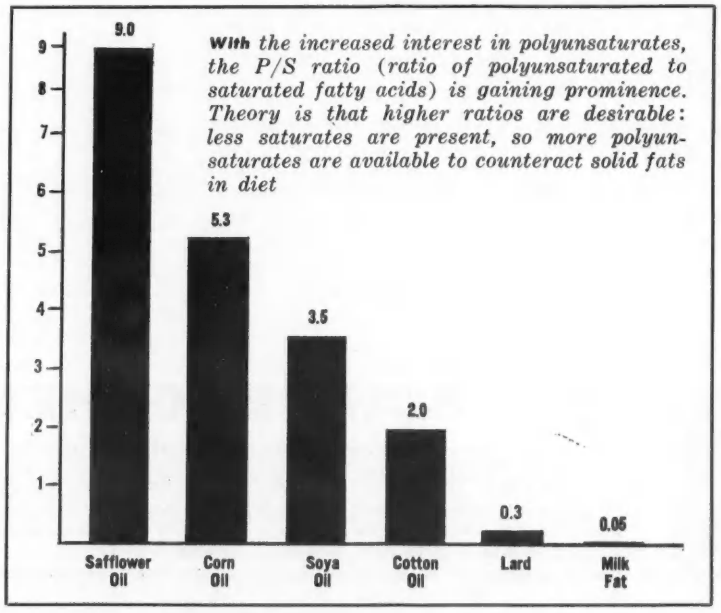
• **Other factors influence price:** At this point, another factor enters the supply-demand picture: soy bean oil is not universally interchangeable for other oils in food formulations.

Examples are potato chips and similar deep fried products. Some processors have built up a consumer preference for corn oil, while others use cottonseed, sometimes combined with corn and/or soy oil.

However, soy oil has not made great inroads on the chip business because of taste and frying characteristics, and effect on product shelf life.

Nor is soy bean oil being used as the liquid component of the new "polyunsaturate" margarines, although it can still be used for the hardened or hydrogenated portions.

Likewise, soy oil has never been successful in the salad



***With** the increased interest in polyunsaturates, the P/S ratio (ratio of polyunsaturated to saturated fatty acids) is gaining prominence. Theory is that higher ratios are desirable: less saturates are present, so more polyunsaturates are available to counteract solid fats in diet*

SUPERESINS®

WILL SLASH YOUR COSTS

DRAMATIC SAVINGS are being made by large food processors and meat packers who have switched to FRITZSCHE'S new line of essential oil – oleoresin mixtures...

SUPERESINS®

When extended on a dry soluble carrier (such as salt or anhydrous dextrose), these carefully controlled, standardized materials replace the corresponding natural spices *pound for pound.* By using them, manufacturers can now *prepare their own dry soluble spices as needed,* thus eliminating the higher cost, bulk storage and deterioration problems often associated with the commercially made offerings. SUPERESINS® are made in our Clifton plant from the finest grades of selected spices and all conform to Federal Specifications EE-S-645. Examine the accompanying list and then write us on your letterhead for free test samples of those that interest you.

ALLSPICE
(Pimenta Berries)
BASIL
BLACK PEPPER
CAPSICUM
CARAWAY
CARDAMOM
CELERY
CINNAMON
CLOVE
CORIANDER
CUMIN
DILL SEED
FENNEL
GINGER
MACE
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SAGE
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The above SUPERESINS® *are available in 5 gal. (35 lb.) steel pails with pouring spouts and covers.*

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oil market because of flavor, frying, and shelf life difficulties. A few brands of all-soy salad oil appear in health food stores.

Glancing at the tables of polyunsaturates, soy oil would appear to be major candidate to meet the new demand for polyunsaturates. What keeps it from fulfilling this role?

Researchers have been studying this problem for years. Soy bean oil is a complex mixture which so far has resisted attempts to cure its problems, which range from taste in some products, to chemical changes during cooking, to inadequate shelf life in other cases.

It differs in composition from other oils in at least one respect: its linolenic acid* content is from 3 to 8%, whereas the other food oils have traces or none. Other adverse factors complicate the soy researchers problems.

A major breakthrough which would make soy bean oil interchangeable with other food oils would see a sharp swing toward soy oil until new price patterns became established. At the moment this prospect appears dim.

• **Safflower enters the big leagues:** The last oil on the cost charts, safflower, is a newcomer to the mass oil market supply picture. Its supply and demand are related, since oil is the primary product, with a high quality cattle and poultry feed as a by-product.

Safflower oil supply has been increasing steadily over the past eleven years since its introduction as a US crop.

Originally developed by one company — Pacific Vegetable Oil Corp., San Francisco — it is now being produced by others. The crop has increased approximately 30% each year, and continues to expand without government price or crop support.

For several years, most of the supply was used in paint and varnish industry because

*Not to be confused with linoleic acid, the major polyunsaturated fatty acid of vegetable oils

of its high content of polyunsaturates.

PVO pushed research in refining it for food uses, and developed successful antioxidant systems.

• **How it can be used?** From users standpoint, safflower rates high on almost all counts. It is light colored, bland and pleasant flavored, readily usable as salad oil, and in mayonnaise, margarines and shortenings. It has a lessened "oily taste" feeling because of a low viscosity.

PVO reports that technical division of companies making such products as the above report that safflower oil has an initial flavor better than cottonseed oil, and a shelf life which approximates cotton, and is better than soya.

Safflower oil begins to cloud at 0°F. The absence of linolenic acid helps account for acceptable storage life results of over one year (in amber bottles with N_2, stored at the warm temperatures of Phoenix, Arizona).

The oil can be used practically interchangeably with other oils in most food products, including breads and rolls.

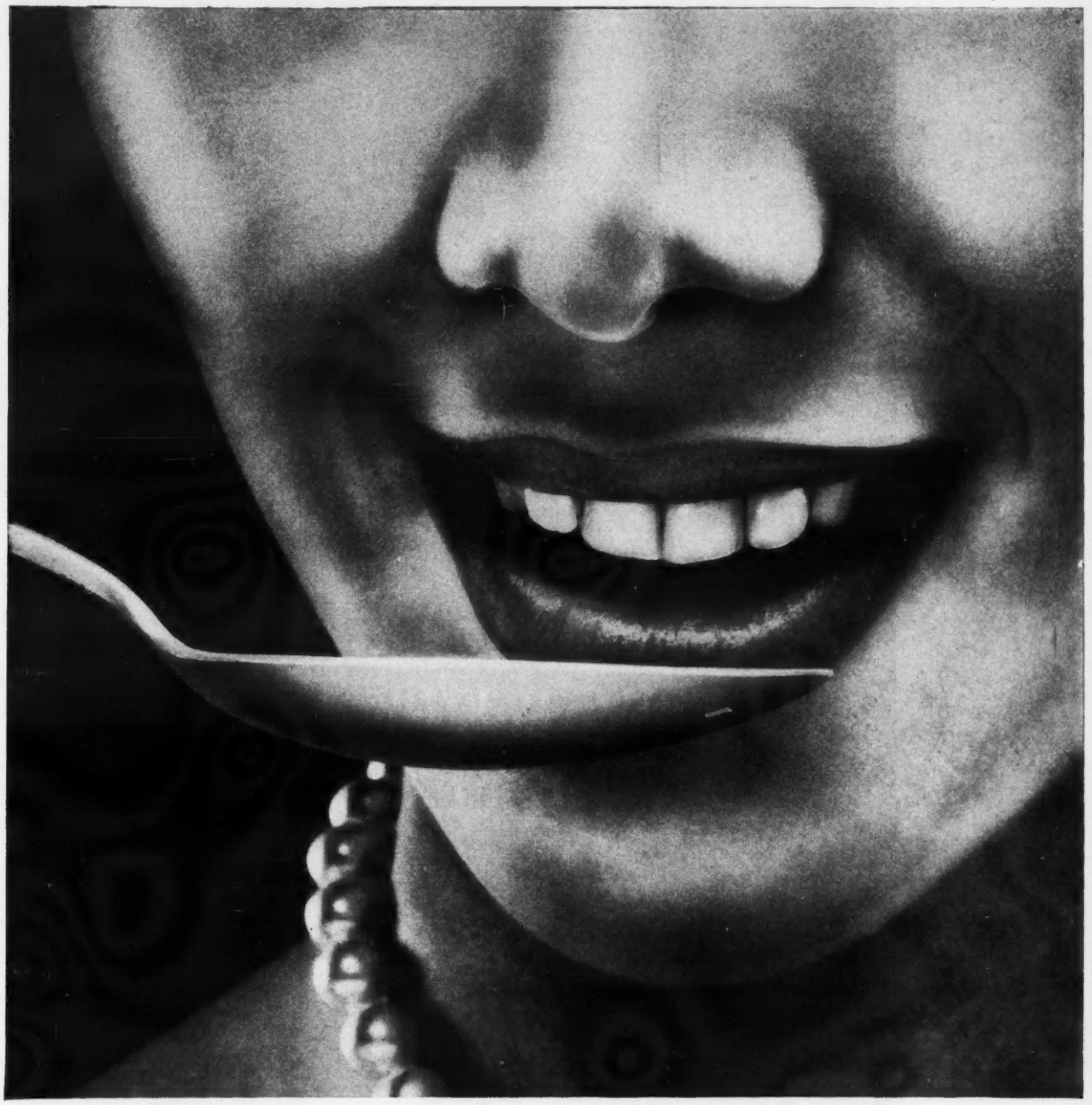
For shallow frying, slightly more oil is suggested than when using a solid shortening, and heated surfaces should be kept free of film. It is not recommended for greasing of bakery pans.

In deep frying, contact with metals at high temperatures for long periods should be avoided, as with all vegetable oils.

The smoke point of safflower is higher than other cooking oils, running between 470°-500°F.

There is no advantage to hydrogenating the oil, as this reduces or eliminates the polyunsaturates. To preserve the polyunsaturates in solid forms (for margarines, filled dairy products) the liquid oil is captured in a matrix composed of other hydrogenated oils, or is put into suspensions, followed by storage either with or without refrigeration.

PVO in the past has sold saffower oil on a guaranteed contract basis, where the user



IMPROVE FLAVOR AT RETORT TEMPERATURES WITH STABILIZED HVP-PROZATE

If you process meats, soups or other canned goods that are subjected to high retort temperatures, look to HVP-Prozate for heat-stable flavor.

Prozate® is a hydrolyzed vegetable protein flavoring agent that has been specially stabilized to withstand high temperatures. It is derived from plant protein and imparts either a rich, meaty flavor or a pleasant background flavor, depending on concentration. Prozate is easy to use, can be quickly incorporated into your present formula, and a little goes a long way.

In addition to HVP-Prozate, Hercules offers a full line of other HVP® products tailored to meet the specialized needs of the food industry. For details about Prozate and a sample of it—or for technical help—write to Hercules.

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Pfizer MSG is a pure white, crystalline, free-flowing, readily water-soluble material that lives up, in every detail, to the Pfizer reputation for quality products.

Place your order now or send in the coupon for additional details.

Please send me a test sample and technical literature of NEW Pfizer MSG.

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A symbol for a perfect pack...

DIAMOND CRYSTAL FLAKE-TYPE SALTS

- Uniformly 99.95% Pure
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Diamond Crystal Flake-type Salts, made by the exclusive Alberger process, assures a flake-like crystal of extremely high purity. Precision screening provides a wide range of sizes to meet all requirements. This high purity and controlled size represents a MEASURABLE MARGIN OF SUPERIORITY over ordinary granular-type salts.

Diamond Crystal Flake-type Salts contain less than 20 parts per million insolubles. Filter pad tests consistently indicate that it has the lowest content of insoluble matter or foreign material of *any* canning salt. The low content of injurious compounds (calcium, magnesium) and trace metals provides the required purity that permits still further up-grading of your product. The unmatched cleanliness of this salt avoids reaction with oxalates and formation of white precipitate. Because of this, Diamond Crystal Flake-type Salts bring out the natural flavor of your product.

Learn exactly how these product features can benefit you. Call or write the nearest Diamond Crystal sales office.

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agrees to purchase a specified amount during the year.

A clause which protects the user against a price drop under specific guaranteed purchase contracts has also been available. Since February, 1960, the price has been around 20¢ per lb (F.O.B. Berkeley, Calif.). Prior to that, the price was 25¢ per lb.

• **Adequate, stable supplies in sight:** A few years ago, the supply of safflower seed at the farm level depended upon enough farmers who were willing to take a chance on getting a paying crop for a relatively unknown thistle plan under untried conditions.

Now the picture has changed and safflower can be considered a stable crop, with production coming from several regions, including the San Joaquin Valley in central California, and other areas in Montana and Nebraska.

With this diversity, plus new cultural and harvest methods and improved varieties, the supply is no longer dependent on the weather whims of one geographical location and it is no longer dependent on one supplier.

Approximately one-third million acres produced safflower seed for oil in 1961.

• **What's the future?** Present conclusions on the food oil scene are that some processors will tend to swing towards saffower oil to woo the polyunsaturate market.

The higher ratios of polyunsaturates in safflower oil will be basis for new advertising programs.

This in turn will offer special opportunities to processors who are not committed to corn oil in their advertising, nor to cottonseed oil in their supply situation.

With safflower entering the picture strongly, pressure on corn and cottonseed oil supplies and prices can be expected to ease, other things being equal.

If enough processors get on the safflower bandwagon early and tie up the bulk of the 1962 supply, the pressures on remaining safflower supply could show a price trend in 1962 similar to the corn oil

trend in 1961.

At the same time, this trend could relieve the pressure on corn oil prices.

Further information on safflower oil may be obtained from Pacific Vegetable Oil Co., 62 Townsend St., San Francisco 7, Calif.

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Cuts rennet requirements for cheese

Pepsin coagulant, compounded to meet the most rigid cheese-industry standards of performance, supplements or replaces rennet extract in cheese making.

Coagulant was extensively tested in cheese-making trails to compare effect of pepsin, rennet and combination of the two at various levels of addition on quality and curing properties of cheddar cheese.

Results of studies indicate that use of pepsin alone or rennet and pepsin combination will produce a product that will meet requirements for short-hold cheese. For long-hold cheese, manufacturer definitely recommends use of rennet extract with pepsin.

All ingredients of standardized DFL Pepsin Coagulant are specified on label.

Supplier: Dairyland Food Laboratories, Inc., 620 Progress Ave., Waukesha, Wis.

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Strawberry industry unites to solve 'Mexican problem'

Eight major strawberry-producing states have organized to conduct a determined program "to curtail the detrimental effects of Mexican strawberry imports on the market for domestic strawberries."

How Mexican imports have been used to split the U. S. strawberry industry into competing factions was discussed in the September 1961 issue of FOOD PROCESSING.

It was reported then that strawberry buyers and sellers have used Mexican imports to

Land O' Lakes New Sodium Caseinate

It's here! First 90% pure protein dairy product with a bland taste and odor

Fantastic new dry milk protein has uses not yet discovered (do you have one?)

Sodium Caseinate was the protein dairy product with problems. Up to now, it did not lend itself to manufactured foods because of its flavor and odor.

Interest in sodium caseinate was high because of its high concentration of milk protein.

LAND O'LAKES GOES TO WORK

Because of this intense interest, Land O'Lakes Creameries in Minneapolis set out to produce an acceptable pure food product by eliminating its undesirable characteristics.

The Land O'Lakes team of chemists and technicians has succeeded in developing an edible sodium caseinate with a bland, clean taste and odor and creamy white color. And it's available now.

90% PROTEIN, 1½% FAT

At last, the dairy product the food industry has been waiting for. Sodium caseinate with many desirable characteristics. 90% protein. 1.5% fat. And it's manufactured from fresh sweet skim milk, not reprocessed casein.

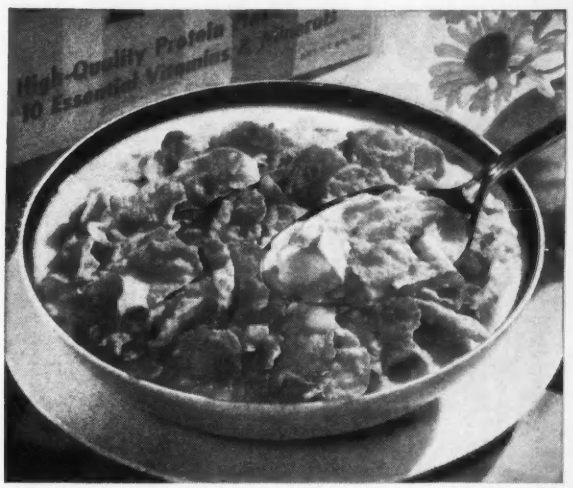
8 AMINO ACIDS

Land O'Lakes sodium caseinate is rich in all the essential amino acids. 50 grams of Land O'Lakes sodium caseinate supplies more than the minimum daily requirements for adults of each of the 8 essential amino acids.

Lysine is one of the most sought after, and least available, of the amino acids. But Land O'Lakes sodium caseinate has it. 50 grams has more than four times the daily minimum requirements for adults!

'CUTS SHRINKAGE FROM COOKING TO A MINIMUM,' SAY SAUSAGE MAKERS

Land O'Lakes sodium caseinate greatly cuts down the loss of natural fats and juices in the cooking process of sausage. Why? Because it absorbs three times its own weight in water. Because sodium caseinate in sausage is an excellent binder. It's the next best thing to "sanforizing," they say.



Cereal makers discovered new way to boost protein in their product by adding Land O'Lakes sodium caseinate. Added benefits developed, too. The cereals toasted better, stayed crisp longer in the bowl.

Meat processors are at work this very minute seeking new uses for sodium caseinate, the wonder milk protein, in their products. Are you keeping up with their progress?

SYNTHETIC WHIP TOPPING DOESN'T FALL DOWN ON THE JOB, THANKS TO SODIUM CASEINATE

Wonderful response has come from synthetic whip topping manufacturers. They report sodium caseinate gives body and long life to their product. Its color is perfect. There are no odors or flavors to mask.

Can these applications of Land O'Lakes sodium caseinate offer a clue to new ones for you? Can you use this 90% dry milk protein in your products? Let us help. We'll work with you to build a better product.

Land O'Lakes. *New* Sodium Caseinate

Write, wire or phone. The number is STerling 1-4811. We will answer your questions fast, then wire your local Land O'Lakes representative immediately.

Land O' Lakes Creameries, Inc. • Minneapolis 13, Minnesota

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QUALITY GOES UP

COST COMES DOWN

WHEN YOU SWITCH TO

PENFORD CORN SYRUP

There are so many reasons why you are better off with a liquid corn syrup system . . . and best off with Penford Corn Syrup! Our technical service representative can prove every point on this quick checklist — and tell you other advantages too:

Penford Corn Syrup is convenient to use, adapts to automation

- *Can be proportioned accurately*
- *Simplifies mixing*
- *Lends itself to automation*
- *Improves plant appearance and sanitation*

Penford Corn Syrup improves the quality of your product

- *Enhances natural flavors*
- *Controls sweetness*
- *Aids in developing body and texture*
- *Stabilizes color*

Penford Corn Syrup saves money over a dry system

- *Reduces cost per hundredweight of sweetener solids*
- *Reduces man hours*
- *Saves handling equipment*
- *Saves with tank storage*

Whether your business is candy, canning, frozen desserts, baking or meat packing—there's a Penford Corn Syrup to suit your needs. Why not let one of our technical representatives come to your plant to demonstrate its advantages from your particular point of view? Call or write any P & F office for prompt action.

Penick & Ford

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play one producing area against another in a price-cutting "merry-go-round."

A campaign to combat the damaging price declines, created by the continually increasing imports from Mexico, has been launched by the California Strawberry Advisory Board. This organization is sponsored by California strawberry growers, processors and shippers.

Other states which have joined California in this campaign include Michigan, Kentucky, Oklahoma, Arkansas, Louisiana, Tennessee and Texas. Other strawberry-producing areas, especially Oregon and Washington, are expected to join in the near future.

A special committee has been appointed by the CSAB to work with groups from other states, Federal and State Departments of Agriculture and the University of California to determine "proper avenues of approach" with the Tariff Commission to solve the Mexican import problem on a permanent basis.

Further information about this campaign can be obtained from the California Strawberry Advisory Board, P. O. Box 57, Santa Clara, California.

Instant Dough

no equipment change

No longer is it necessary to waste valuable time and plant space for the prefermentation of yeast-raised doughs.

A product called Valley Fresh Reddi-Sponge develops dough instantly — during mixing — to give top quality sweet goods, white bread and specialty breads.

The 4 to 5 hours necessary to condition and mature dough during the prefermentation (sponge) step is eliminated. Only 15 to 45 minutes floor-time is required before dough is ready for machining. Thus, as little as 2 hours is necessary to go from scaling to baking.

When Reddi-Sponge is used at approximately 4 to 5 per

cent of the weight of the flour, a controlled biochemical reaction replaces the long prefermentation stage. No special equipment or changes in processing methods are required.

By eliminating prefermentation, a major cause of batch deviation, color and texture of finished products are consistently uniform.

Reddi-Sponge contains dry whey, L-cysteine, potassium bromate, lactose, lactalbumin, milk minerals and water soluble vitamins. It can be used in all non-standardized bakery products.

Other characteristics and advantages of using the product are given in a 4-page bulletin offered by the supplier: Western Condensing Co., Division of Foremost Dairies, Inc., Appleton Wisc. 6742 on Reader Service Slip.

Another commercial source of MSG

A microbiological process for the volume production of MSG has been developed by the research organization of Commercial Solvents Corp.

The process harnesses a bacterial organism recently discovered in Japan to make MSG crystals of high purity.

Because of its exclusive rights to the organism and the patented process the company is expanding its biological production facilities at Terre Haute, Indiana to make monosodium glutamate in commercial quantities.

By mid-1962 Commercial Solvents plans to be a major U. S. producer of MSG.

"Okay on that last batch."

KELCO COMPANY

REFINED ALGIN PRODUCTS

technical bulletin

Use unique Kelco Algin Colloids to improve your food products

In Frozen Foods, Kelcoloid, in acid to neutral foods having oil-water systems, provides emulsion stability. Coarse ice crystal formation is retarded. Kelcoloid holds structure of food, maintains smooth uniform texture, and promotes complete flavor release.

In Gravies, and in Cream, Meat and Barbecue Sauces, Kelcoloid provides efficient emulsion stability, and aids in thickening and bodying, too. Kelcoloid produces properly stabilized, free-flowing sauces that are homogenous and eye appealing, with clean full flavor. Shelf life is measurably extended.

In Salad Dressings, Kelcoloid, highly efficient stabilizer, prevents body separation and markedly increases shelf life. Kelcoloid promotes a uniform, smooth consistency giving dressings a highly desirable, palatable appearance.

No Surer Way to Achieve Effective Emulsion Stability

KELCOLOID HVF, the high viscosity member of this series, is generally recommended for use where a decided increase in viscosity is desired along with effective emulsion stability.

KELCOLOID LVF, the low viscosity member of this algin series, produces excellent emulsion stability and desirable body qualities. The LVF is recommended for use where a high degree of emulsion stability is desired with a minimum change in viscosity and body properties.

YOURS ON REQUEST: Free samples of KELCOLOID and other Kelco algin products, plus Technical Data describing properties, advantages and uses. At your service, too, are highly qualified food technicians ready to give individual attention to your problems. Write without obligation to your nearest Kelco regional office.

Kelcoloid HVF® Kelcoloid LVF® products of Kelco Company

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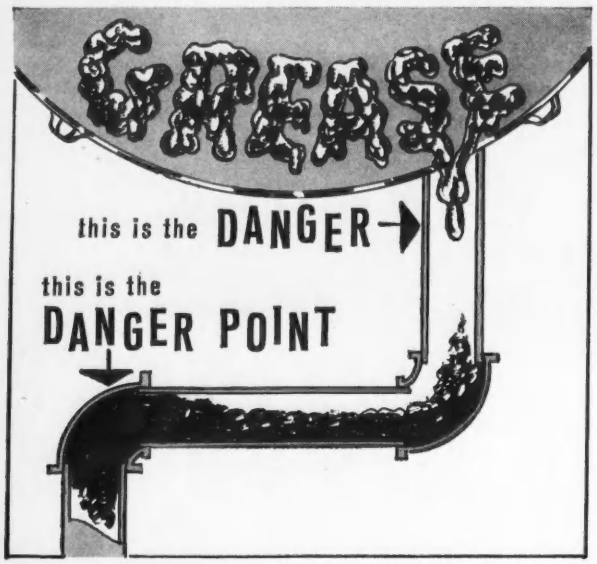
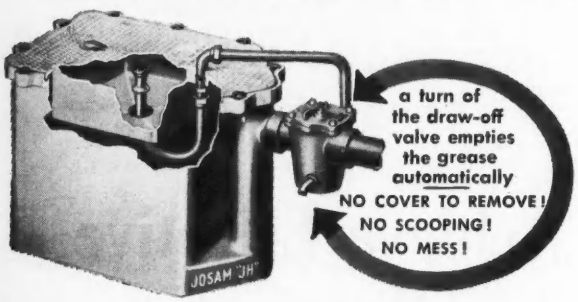


Josam SERIES "JH"

GREASE INTERCEPTORS

intercept the grease . . . keep pipe lines clean

THE ONLY INTERCEPTOR THAT DISCHARGES THE COLLECTED GREASE AT THE TURN OF A VALVE!



• Greasy wastes, when poured down the drain, build up layer upon layer until the entire waste line is clogged up. Why wait until the resulting trouble, expense and inconvenience happen to you, when it's so easy to prevent? With the Josam Series "JH" Interceptor you not only reclaim over 95% of the grease in waste water but, at the "turn of a valve" you automatically draw off the grease into convenient containers.

No other interceptor provides these features and the cost is so little compared with the inconvenience and expense prevented! Get complete details by writing for Manual "JH" today.

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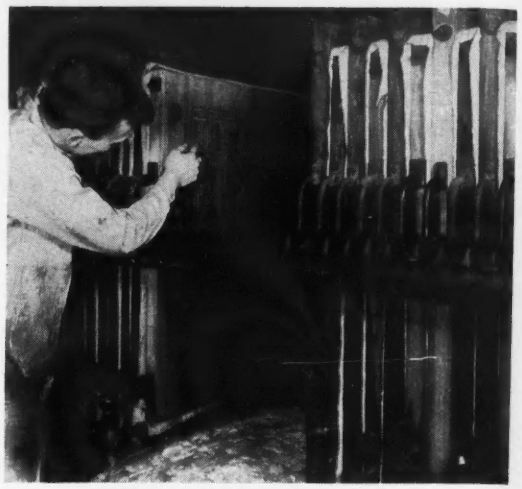


After three years of service, grooves in wooden plates are still in very good condition. Resin impregnated pine plates and frames will swell or shrink up to 75 per cent less than original units when exposed to moisture. They are about 70 per cent harder than untreated wood, have 300 per cent greater crushing strength and 25 per cent higher modulus of elasticity

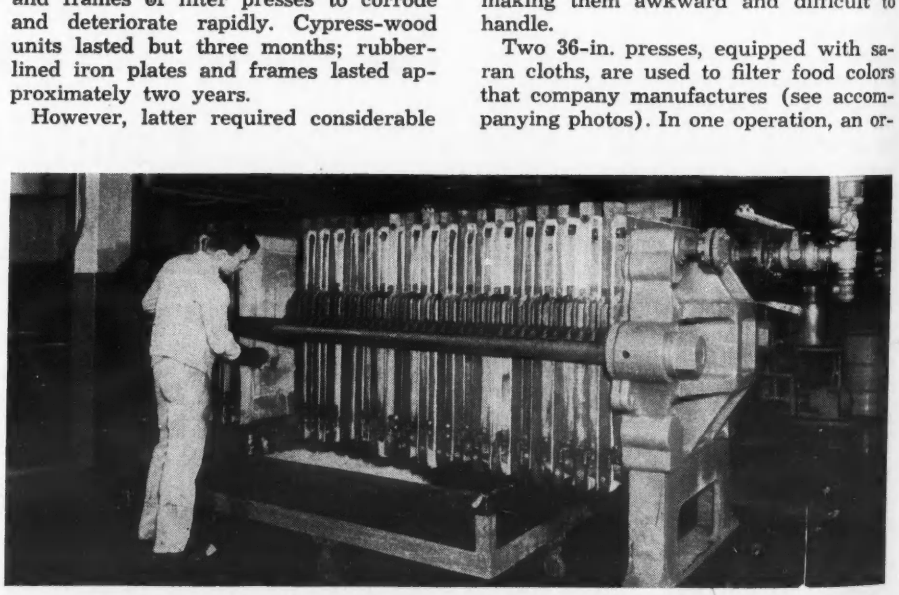
Cuts maintenance, replacement in filtering high-acid slurries

Resin-impregnated, light-weight wood filter plates and frames withstand 1-2 pH solutions; pay for themselves yearly

PROBLEM: At Wm. J. Stange Company, filtering strong acid slurries caused plates and frames of filter presses to corrode and deteriorate rapidly. Cypress-wood units lasted but three months; rubber-lined iron plates and frames lasted approximately two years.

However, latter required considerable maintenance and repair. In addition, they weighed 260 and 120 lb respectively, making them awkward and difficult to handle.

Two 36-in. presses, equipped with saran cloths, are used to filter food colors that company manufactures (see accompanying photos). In one operation, an or-



One of two 36-in. filter presses used in producing food colors by Wm. J. Stange Company. Organic-acid slurries (pH 1.0) are filtered in 700-gal batches; have about 28.5 cu ft of amorphous-flake filter cake. Sulfonated organic amine slurries (pH 2.0) are filtered in 380-gal batches; have about 19 cu ft of cake

ganic acid slurry at pH 1.0 is pumped through filter at 32-50 F. In a second case, sulfonated organic amine slurry mixed with dilute sulfuric and sulfurous acids is filtered at 70 F. This material is at pH 2.0 and contains 10.6 per cent solids.

Solution: Three years ago, Stange tried low-cost plate and frames made of pine wood, impregnated with a thermo-setting phenolic resin. This resin, which is same type as used in Bakelite plastic, is virtually inert to all chemicals except some strong oxidizing acids, strong alkalies and certain strong bleaching agents.

Since it is of low molecular weight, resin not only enters lumen of wood cells during vacuum-pressure impregnation process, but actually penetrates cellulose making up cell walls.

Following impregnation, wood is dried and then held under close humidity and temperature control until resin is completely polymerized.

Results: After three years of service at Stange, impregnated filter plates and frames have required little maintenance and are in good condition. It is estimated that they pay for themselves after every year of operation.

Useful service life is expected to be five years — 150 per cent longer than that of rubber-lined units. Also, because wood plates weigh only 65 lb and frames 40 lbs, their handling is much easier.

Phenolic-resin impregnated plate and frame filter presses are product of D. R. Sperry & Co., Batavia, Ill.

6745 on Reader Service Slip.

Further information on KP impregnated wood may be obtained from Wood Preserving Div., Koppers Company, Inc. Koppers Bldg., Pittsburgh 19, Pa.

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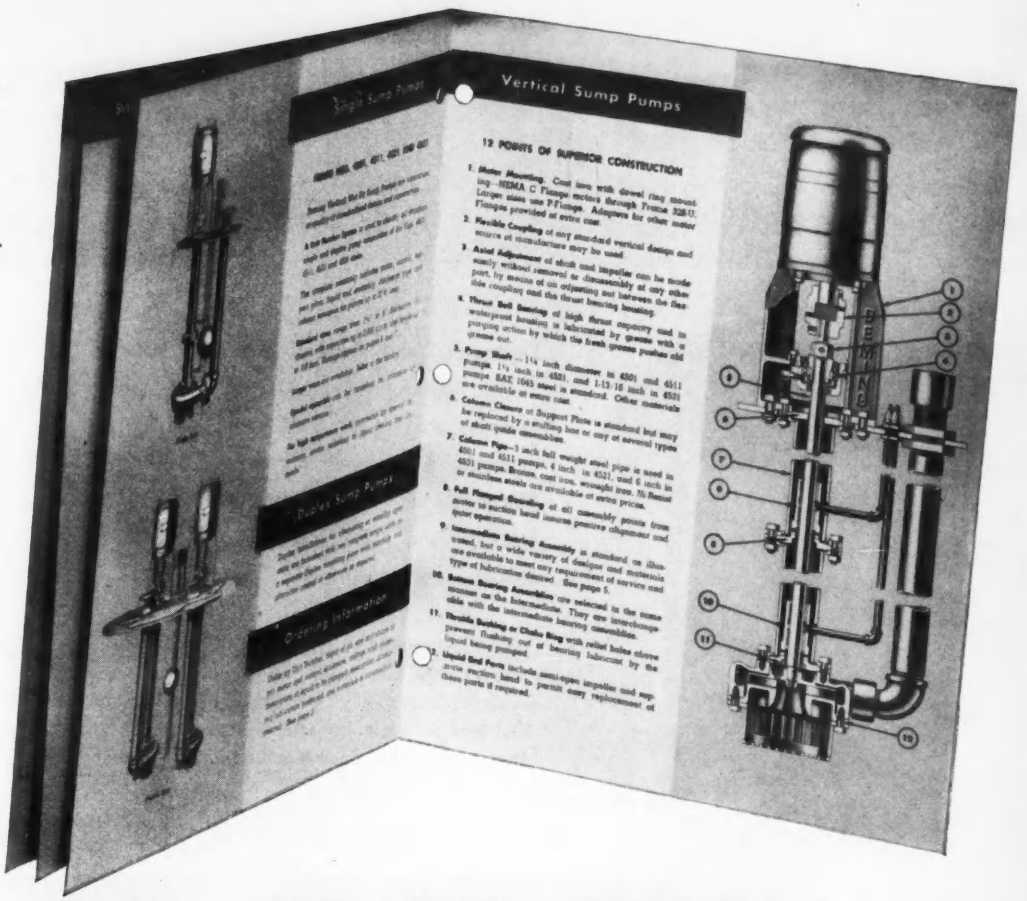
Check page 114 for helpful technical literature

Your specification job is made easier if you have complete information on pumps. Deming bulletins give full technical data on: capacities, heads, construction, dimensions, and performance curves.



NOW...SEE WHY DEMING
can solve your pumping problems at lowest cost

Here is pump information you can use when it's time to talk pumps in your company . . . or when it's time to specify. Up-to-the-minute Deming Bulletins are available that cover heavy duty sump pumps, non-clog sewage pumps, turbines for general water supply, end-suction centrifugals for circulating, specially designed Demings for boiler feed or condensate return units, and motor-mount centrifugals for cooling and circulating. These technical bulletins show you specifically why a Deming will handle the job efficiently . . . and at lowest cost.

Whether your particular pumping problem involves general water supply, getting rid of wastes, working with vacuum pans, washing vegetables, handling citrus pulp or products from pickles to peanut butter, there's an experienced Deming expert near you who can make the proper recommendation.

Let us send you this informative literature and the name of your Deming distributor. Food processing is your business—giving you the exact pump for your conditions is ours. With more than 10,000 Deming pump types, capacities and sizes to choose from, you have good reason to make Deming your headquarters for pumps and pump information. Food processing plants throughout the country have been relying on Deming for more than 80 years.

Send the reply form now . . . and have the facts when you need them.

PLEASE SEND information on the following:

- ☐ **Deming Sump Pumps (or circle 6670 on Reader Service Slip)**
- ☐ **Deming Sewage Pumps (or circle 6671 on Reader Service Slip)**
- ☐ **Deming Vertical Turbines (or circle 6672 on Reader Service Slip)**
- ☐ **End Suction Centrifugals (or circle 6673 on Reader Service Slip)**
- ☐ **Deming Boiler Feed Pumps (or circle 6674 on Reader Service Slip)**
- ☐ **Deming Motor Mount Pumps (or circle 6675 on Reader Service Slip)**

Name_____

Title_____

Company_____

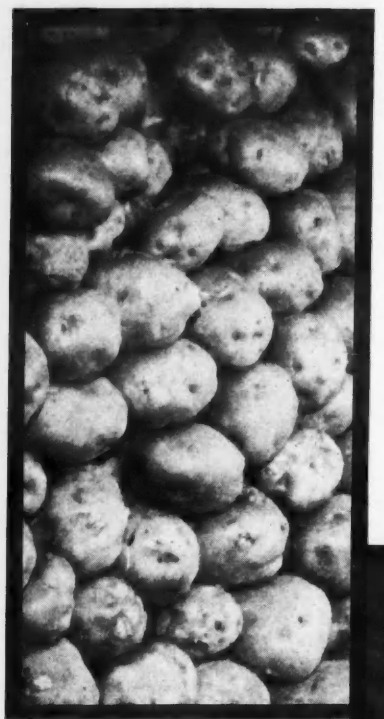
Address_____

City_____ Zone____ State_____

DEMING
DIVISION CRANE CO.
1250 Broadway • Salem, Ohio

See Reader Service Numbers in Coupon.

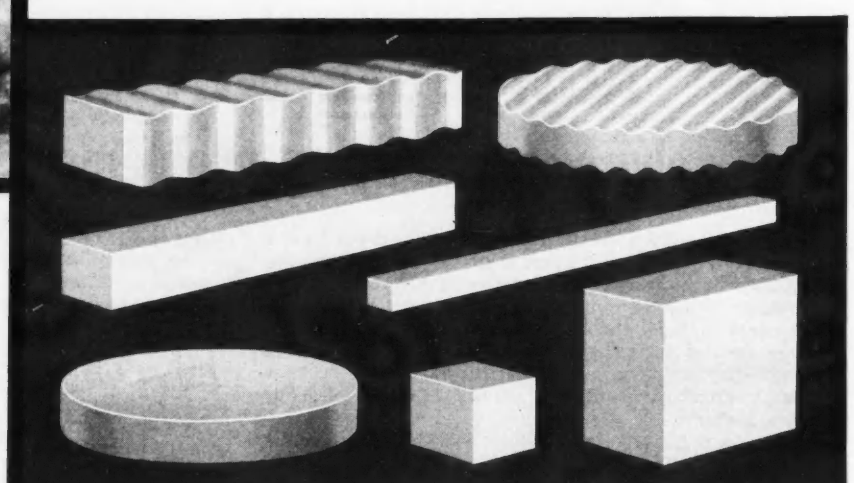
Now you can cut more POTATO shapes and sizes with the Urschel Model GK*

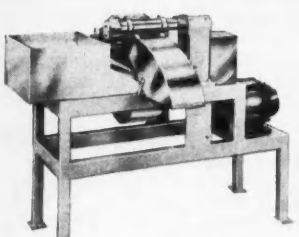


Corrugated French Fry Cuts (3 sizes) 7/16" - 1/2" - 9/16"
Straight French Fry Cuts (3 sizes) 3/8" - 7/16" - 1/2"
Julienne Cuts (3 sizes) 5/32" - 3/16" - 1/4"
Corrugated Slicing – any thickness to 3/4"
Straight Slicing – any thickness to 3/4"
Dices (3 sizes) 3/8" - 7/16" - 1/2"
Specials – many shapes and sizes of plain and corrugated cuts

Other Food Products—The Model "GK" was designed expressly to make tempting corrugated cuts on potatoes. It will produce excellent potato straight cuts, too, but is not recommended for other food products. For straight cuts on other products to sizes listed, request full information on the Urschel Model "G".

The "GK" precision-cuts potatoes up to 11 tons an hour . . . *gently*.





Model "GK"

For detailed information write:

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

* New alternate parts are also available for your present Urschel Model GK —enabling it to cut all these shapes and sizes, too.

Designers and manufacturers of precision, high speed cutting equipment for food products.

Visit Urschel Booth #102, Canners National Convention, Machinery Hall, Americana Hotel, Bal Harbor, Miami Beach, Florida, Jan. 21-24, 1962.

6747 on Reader Service Slip.

sanitation

Flash steam — useful source of heat

Flash steam, what it is, how it can be calculated, and how it can be controlled to save dollars, is discussed in six-page brochure offered by Yarnall-Waring Company.

Entitled "Save Real $ With Flash Steam," brochure points out that one common source of flash steam in many plants is return lines from steam traps used to drain condensate from steam-heated equipment and related steam piping.

Brochure contains table for finding percent flash steam formed; it also has table showing standard flash tanks available together with an example explaining how to size a flash tank. In addition, two diagrams illustrate single- and multistage flash-recovery systems.

6748 on Reader Service Slip.

Pre-weighs, color-codes cleaners

Bonewitz Chemicals, Inc., is now pre-weighing exact amount of right cleaner for each operation and is packaging cleaner in "one-shot" polyethylene bags. Further, each cleaner is colored differenty so that men can associate color with equipment to be cleaned.

System is presented in first section of a three-section, 12-page brochure, Bon-Chem, offered by manufacturer.

Second section presents detailed data on CIP systems and equipment that is push-button controlled.

Third section contains information on chemical cleaners for dairy plants.

6749 on Reader Service Slip.

plants, companies, personalities

V. La Rosa & Sons, Inc.

Brooklyn, continuing an expansion program begun three yr ago, has obtained for cash a major interest in Star Crest Baking Co., Woodside, N. Y., and will operate the latter as a La Rosa division. The newly acquired line of Italian Style cookies, breadsticks and biscuits will be marketed nationally. Star Crest's founder, Samuel Christian, continues as president of the new division.

S. T. Musser Co.

Mountville, Pa., anticipates May 1962 completion for a new 65,000-sq-ft potato chip plant being built in Calhoun, Ky. Production capacity will be 1500 lb of potato chips per hr.

Dean Milk Company

is replacing its present Louisville, Ky., dairy with a new $1,250,000 plant which will have a daily capacity in excess of 500,000 lb of milk.

Durkee Famous Foods

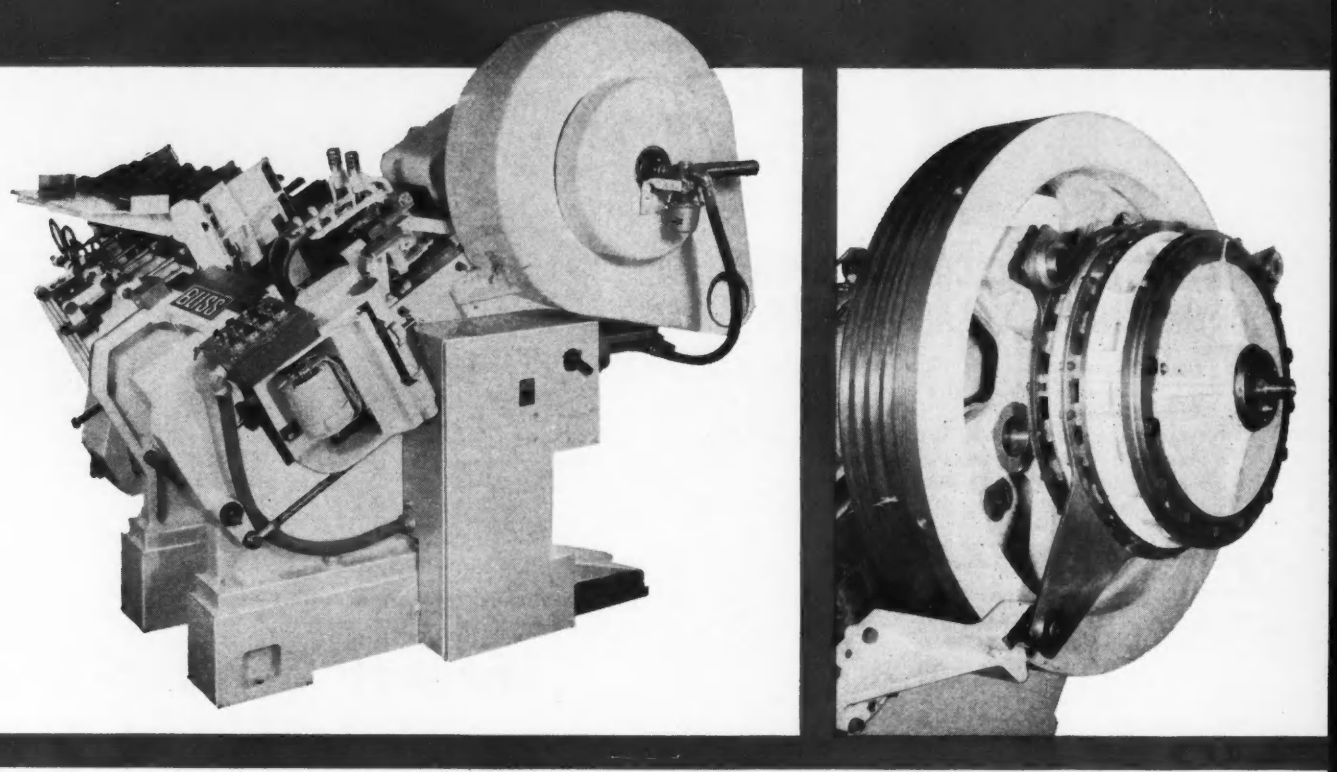
is constructing a $1 million processing plant and warehouse in Louisville, Ky. Completion is scheduled for next spring.

Campbell Soup Company

has announced three grants, totalling $250,000, to the University of Pennsylvania, Drexel Institute of Technology and St. Joseph's College—all of Philadelphia. The last-named institution received its grant toward a fund being raised to erect a building for the College's new Academy of Food Marketing. In fiscal 1961, prior to the newest grants, Campbell contributed $1,500,000 for educational purposes.

For more information on product at right, circle 6750 see information request blank opposite last page.

A NEW CLUTCH MAKES A GOOD CAN-END PRESS EVEN BETTER



New CKU air-friction clutch and brake mounts on outside of flywheel for simplicity of maintenance; has easily-replaced segmental clutch and brake linings. Besides mechanical bumper, CKU clutch offers continuous, single stroke, jog and emergency top-stop control.

Mechanical bumper all but eliminates stuck-press production losses

Output rates ranging to 650 can ends per minute have made the Bliss High Speed 1831 press a favorite with can makers and food packers alike. Now, thanks to a new clutch, even the infrequent production losses caused by the press' "sticking" at bottom dead center have been virtually eliminated. The fast-acting new "CKU" clutch has all the advantages of the Bliss CK combination air friction clutch and brake, proven in thousands of punch press applications. These include mounting on the outside of the flywheel providing easy accessibility and avoiding drip of lube oil on brake linings; easily-replaced segmental clutch and brake linings; positive engagement and disengagement; and automatic compensation for wear.

To these has been added a mechanical bumper which takes only seconds to free the press if it locks at bottom stroke.

Available in both strip feed and roll feed models, the No. 1831 press is designed for speeds higher than 300 strokes per minute. It can be used with either double or single dies. Special features include a counterbalanced crankshaft and a rugged, one-piece cast Meehanite frame.

For complete details, write today for a copy of our four-page data sheet, section 75, pages B1 to B4.

BLISS SINCE 1857 ®

BLISS is more than a name—it's a guarantee

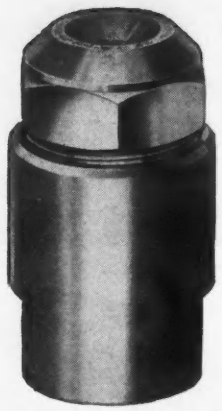
E. W. BLISS COMPANY

Container Machinery Division, Hastings, Michigan

Foreign Subsidiaries: E. W. Bliss (Canada) Ltd., E. W. Bliss (England) Ltd.
E. W. Bliss Co. (Paris) France, E. W. Bliss-Henschel G.m.b.H., Düsseldorf, West Germany

PRESSES • ROLLING MILLS • ROLLS • CONTAINER MACHINERY • CONTRACT MFG. • PUBLIC SAFETY

See it in our booth (#111) at the Canners' Show



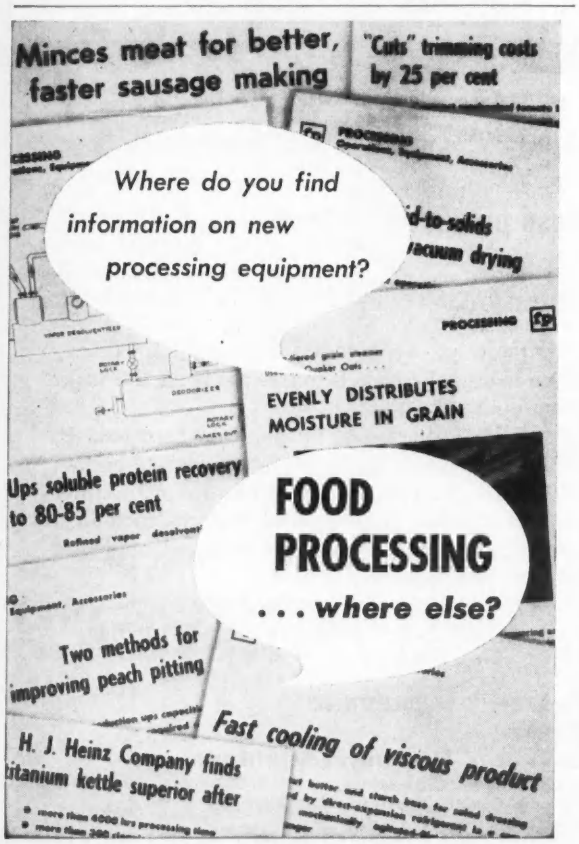
DELAVAN CARBIDE SPRAY DRYING NOZZLES LAST LONGER

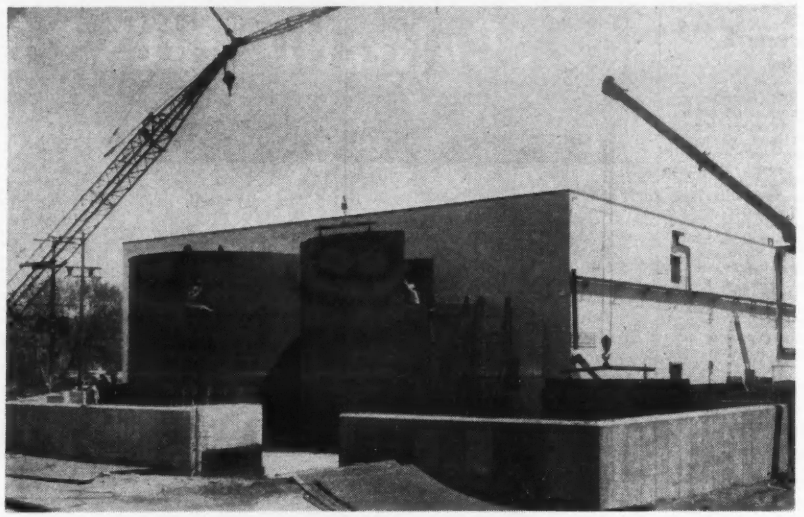
Tungsten carbide orifice plus patented swirl chamber combine to give you a longer lasting, better performing nozzle. Flow rates and spray angles are certified — your assurance of performance as rated. For full facts on the Delavan SDX (illustrated) and others, write for Catalog SD-1 and SD-2.

DELAVAN Manufacturing Company
WEST DES MOINES, IOWA

Canadian Representative
ONTOR LTD., 12 Leswyn Road, Toronto 19, Ont., Canada

6751 on Reader Service Slip.


Minces meat for better, faster sausage making
"Cuts" trimming costs by 25 per cent
Where do you find information on new processing equipment?
EVENLY DISTRIBUTES MOISTURE IN GRAIN
Ups soluble protein recovery to 80-85 per cent
FOOD PROCESSING
. . . where else?
Two methods for improving peach pitting
H. J. Heinz Company finds titanium kettle superior after
Fast cooling of viscous product



Beginning of Lawton, Mich., installation. Erection of building and tanks progresses simultaneously. Two of the five tanks are in process of construction. Wall foundation, outlining storage building, has been poured

Welch builds nine 273,500-gal mild-steel tanks with inner lining —

FP STAFF

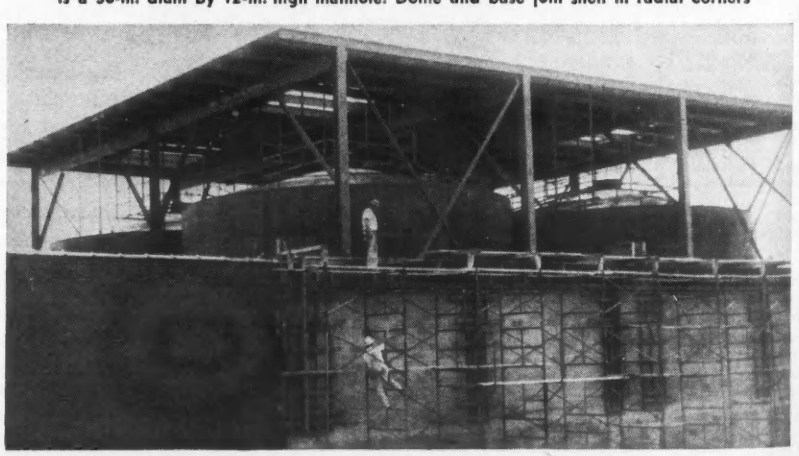
Largest Concord-Grape Juice tanks in industry

BY FAR THE LARGEST juice storage tanks in Concord-Grape industry — fabricated from mild steel and lined on inside with a glass-like coating — are being completed for Welch Grape Juice Company, Inc., Westfield, N.Y. New tanks will have a capacity of 273,000 gal each; largest tanks presently in use in industry (by Welch) have a capacity of 147,000 gal.

Four of the giant storage tanks are being built in a refrigerated tank room at Welch's plant in North East, Pa., see photo below; five other tanks and another room to house the tanks are being built at Lawton, Mich. plant, see photo above.

The two installations represent an in-

Nearly completed installation at North East, Pa. Tanks have 4-ft high dome in center of which is a 36-in. diam by 12-in. high manhole. Dome and base join shell in radial corners



vestment of about $600,000. Total of nine tanks will increase company's storage capacity by approximately 2½ million gal.

Each of the new tanks is 31 ft-6 in. in diam and 44 ft high. Constructed of mild steel (about 25 tons/tank), they are being fabricated in knocked-down form and shipped to job site for field erection and lining.

Lining used is a thermosetting phenolic resin formulation. Lastiglas, as lining is called, is sprayed on in several applications till desired thickness is obtained. Between applications, coats are set up by heating internal air to 400 F and holding at that temperature for one to two hours. Final coating is cured at 425-450 F.

Air in tanks is heated by a portable, gas-fired air heater with maximum output of 500,000 Btu/hr.

Resulting hard, smooth lining is resistant to corrosion and contamination, will not impart odors or flavor, and can be quickly and thoroughly cleaned.

Details on construction of tanks and application of lining are available from fabricator-lining contractor, The Bishopric Products Company, 4413 Este Ave., Cincinnati 32, Ohio.

6752 on Reader Service Slip.

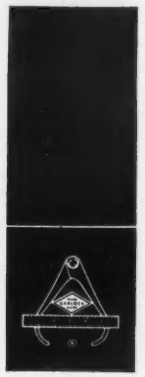
Better insulation bond with mortar additive

For bonding Styrofoam insulation boards to masonry, cured concrete or metal, portland-cement mortar additive has synthetic latex particles that greatly increase mortar adhesion. Additive also reduces water and water-vapor transmission through mortar, and results in over-all stronger mortar.

One five-gal pail of Styrocrete, as the additive is termed, is stated to be sufficient for three cu ft of portland-cement mortar. Applied to Styrofoam in 3/16-in. thickness, 5 gal should cover about 200 sq ft.

Supplier: The Dow Chemical Company, Midland, Mich.

6753 on Reader Service Slip.



GASKETS
for Food
Processing

For tight sealing against high temperature steam and corrosive liquids, specify Garlock gasketing . . . available in either sheet or cut form or special construction.

For all your gasketing needs, choose from a complete line of Garlock materials. Regardless of service conditions, there is a specific Garlock style for the job.

In either sheet form or cut to your specifications, Garlock offers **Style 7021** synthetic binder and long fibre asbestos, superior for hot oil service at 700°F; **Style 7228** high quality neoprene binder and long fibre asbestos, for gasoline, naphtha, benzine and other hazardous liquids and solvents, temperature to 300°F; **Style 7705** synthetic binder with blue African asbestos fibre, excellent against hot and cold mineral acid; **Style 900** long fibre asbestos with synthetic binder, for service against steam, gas, air, temperatures to 700°F; **Style 7772,** long fibre asbestos with synthetic binder, white in color, for service in chemical and petrochemical process equipment where leeching is a problem, temperatures to 700°F. Other gasketing materials available to meet your specific requirements.

In rubber sheet form, Garlock offers Style 7986 Neoprene sheet for flanged joints where oil resistant qualities of neoprene are required; **Style 8495** Buna-N sheet for gasketing against oils and solvents at temperatures up to 300°F; **Style 7992** Neoprene rubber diaphragm sheet for wet natural gas, gasoline, oils at medium or high pressures; **Style 9296** Silicone-Dacron diaphragm sheet for hot or cold air, high aniline point oils and many fire resistant fluids at temperatures to 300°F.

For prompt delivery, complete gasket cutting facilities are available in Palmyra, N. Y., Houston, Texas, and San Francisco, Calif. Get details by contacting the nearest of the 26 Garlock sales offices and warehouses throughout the U. S. and Canada. Or, write Garlock Inc., Palmyra, N. Y.

GARLOCK

Canadian Div.: Garlock of Canada Ltd.
Plastics Div.: United States Gasket Co.

Order from the Garlock 2,000 . . . . two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products.

6754 on Reader Service Slip.

Electron micrograph of Escherichia Coli.

Order Stainless Steel from your nearest Steel Service Center.

Stop Escherichia Coli

The best way to stop product spoilage is to have clean equipment. If your equipment is Stainless Steel, micro-organisms like Escherichia Coli can be quickly eliminated because Stainless Steel is one of the easiest materials to clean and keep clean. Stainless' surface is so smooth and "dense" that contaminants can't get a foothold, and normal cleaning methods keep Stainless Steel sanitary.

Stainless Steel doesn't "age" or break down. It has superior corrosion resistance and great strength. It does not retain odors or flavors, so you can process any number of different products in your equipment after routine cleaning. Stainless Steel's hard, bright surface won't crack, can't soften and resists scratching; and is not harmed by strong detergents, hot water and stiff bristles. Stainless Steel costs more but it is worth more—in terms of strength, long life, ease of maintenance and lasting good looks. For Stainless Steel, call your nearest Steel Service Center.

United States Steel Corporation · American Steel and Wire Division · National Tube Division · Columbia-Geneva Steel Division · Tennessee Coal and Iron Division · United States Steel Export Company

USS TRADEMARK

United States Steel

New efficiency means you can now handle many mixing jobs with a smaller model drawing less power.
New shock-protected internal gear turns the mixer shaft at a slower, more powerful 350 rpm.
New super-pitch prop delivers up to 45% more fluid flow than previous LIGHTNIN gear-drive models . . . higher impeller head in direct-drive models.
LIGHTNIN

ANNOUNCING

a new level of competence in the mixing of fluids

You get more work out of these all-new LIGHTNIN propeller-type mixers.

They'll handle bigger batches, heavier materials, or do the job faster —*without using more power.*

Often a smaller, lower-cost model will do the job you want done—*on less power than you've been using.* That's how efficient they are.

In normal use, you won't have to lubricate these mixers for five years. Overloads can't hurt the gear drive. The chemical plant motor is standard, at no extra cost.

Notice how we've moved the lower shaft bearing and chuck up out of the mixer base, away from the splash of tank contents. And you don't need three hands to change the shaft. New quick-acting chuck locks it tight when you turn one screw.

They're ready in eight sizes from ¼ to 3 hp, gear drive or direct drive. Ask your LIGHTNIN Mixer representative for details. His name is in Thomas' Register and in the yellow pages of your telephone directory. Or write us for descriptive Bulletin B-521.

FOR CLOSED TANKS. Same all-new design, with new stuffing box or rotary mechanical seal. Also described in Bulletin B-521.

PORTABLES, TOO. New indexing feature makes it a snap to set mixer at the correct angle. Nine sizes, ⅛ to 3 hp. Request Bulletin B-520.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 132-n Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Avenue, Toronto 19, Ont.

In Europe: Lightnin Mixers, Ltd., Poynton, Cheshire, England

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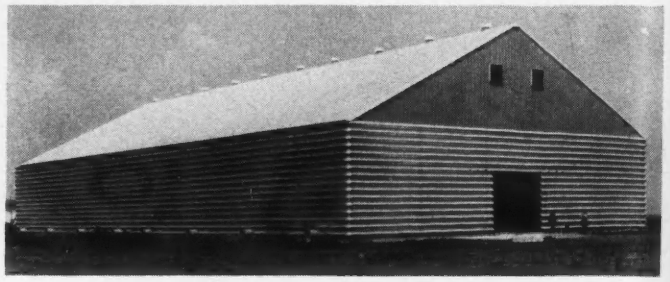


Eliminates 'pockets' in grain-storage buildings

DESIGNED for low-cost grain storage, buildings are erected with 3- by 20-ft corrugated panels that are installed horizontally on rigid frame. Unusual corrugations — 18 in. wide by 6 in. deep with 43° slope — eliminate sidewall girts in construction and grain buildup in storage. Round corners prevent grain from being trapped or leaking out.

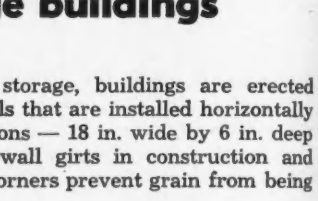
Buildings are made in capacities ranging from 50,000 up to millions of bushels. Standard white roof and blue gables have factory-applied finish.

Supplier: Butler Manufacturing Company, 1283 Eastern Ave., Kansas City, Mo.

6756 on Reader Service Slip.

Improves masonry cavity walls three ways

- **greater strength**
- **better insulation**
- **less infiltration**



Urethane-foam filling being frothfoamed into 180 cu ft cavity. Total time to fill 2½-in. wide by 9-ft high space was 25 min

RIGID URETHANE foam filling of masonry cavity walls, proven in three laboratory tests including year-long studies on 70-ft wall enclosing air-conditioned office, canteen and rest rooms, should find application in food processing plants.

Foam filling improves insulating qualities, provides greater resistance to infiltration by moisture or air, and improves structural strength.

In structural tests, shear-bond of urethane foam upped average ultimate load for three walls two-and-one-quarter times. Therefore, assuming that filled wall functions as solid wall, maximum height could be increased

from 12 to 16-2/3 ft.

Insulating value of urethane-foam formulation is considerably better than that of insulating material containing entrapped air. Material gains its insulation value by entrapping gas in its closed cell structure.

In field tests on the 70-ft long, 10-in. thick wall, see photo, average U factor (Btu/hr/sq ft/° F differential) as determined with heat-flow meters is 0.059 after one winter's use.

Since foam fills cavity completely, seals around door and window openings, and has 90 to 95 per cent closed cells, it greatly increases resistance to transmission of moisture and air. (Vapor transmission rate for 10-in. insulated wall is 0.44 perms.)

To fill cavities, conventional foaming systems or newly developed frothing techniques can be used. No special preparation is needed for cavity interior. However, sufficient time for mortar to develop more than two-third its ultimate strength — about seven days — should be allowed between completing brick work and installing foam.

"Hylene" organic isocyanates and "Freon" blowing agents used in urethane foam insulation are products of The E. I. Du Pont De Nemours & Co. Inc., Wilmington 98, Del.

6757 on Reader Service Slip.

Fiber pipe, fittings have —65 to 300 F range

Non-metallic piping with complete line of fittings has temperature range from —65 F to 300 F. Made of centrifugally cast, thermoset resin reinforced with glass fiber, Fibercast, as the piping is termed, has high tensile strength and low coefficient of heat conductivity.

Various characteristics of corrosion-resistant piping are discussed in detail and applications are explained in 12-page brochure released by Fibercast Company, a division of The Youngstown Sheet and Tube Company.

6758 on Reader Service Slip.

from meat products to baby food

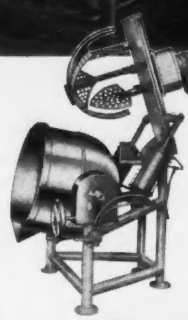
GROEN STEAM JACKETED KETTLES

braise or boil economically faster, simmer or stew without scorching

Controlled cooking temperatures and the efficient GROEN agitators assure proper cooking, uniform consistency and thorough mixing for any food products from Alphabet soup to Zucchini squash. Instantaneous heat transfer cuts processing time as much as 50%. Another time-saving feature is found in GROEN stainless steel construction which makes GROEN kettles virtually self cleaning. Our Engineering and Research Departments are always available to help you in developing custom equipment.

Above: Sanitary Cooker/Mixer kettles batch-cook at Geo. A. Hormel & Co.

Right: New GROEN tilting model with twin shaft agitator.

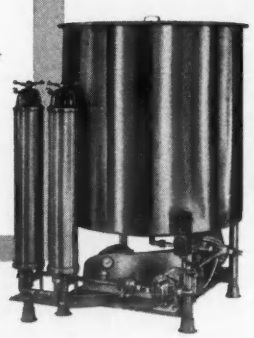


Sparkle-clear beverages with GROEN filters-tanks

The Frank B. Lomax Division of GROEN is one of the oldest and most respected sources for tanks and filters. Whether your needs be small or up to 5,000 gal. capacity, Lomax equipment can help you beat high production cost and meet all sanitary requirements of your community. Lomax products are ideally adapted to a wide variety of applications in the food, chemical, confection and pharmaceutical fields. Write for Catalog 2512.

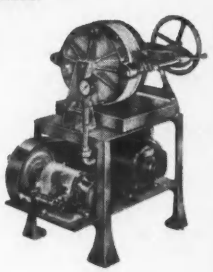
Above: Table-mount tilting kettles gently cook delicate custards, pie fillings.

Right: GROEN pressure cooker with one-point central cover lock.



Left: Mixing and filter unit with twin tubular filters and side agitator.

Below: Plate and frame filters for every type of product in standard and custom sizes.



SINCE 1907 GROEN

GROEN

MFG. CO.

1900 Pratt Boulevard, Elk Grove Village, Illinois

Eastern Sales Office:
1377 Palisade Ave., Teaneck, N.J.

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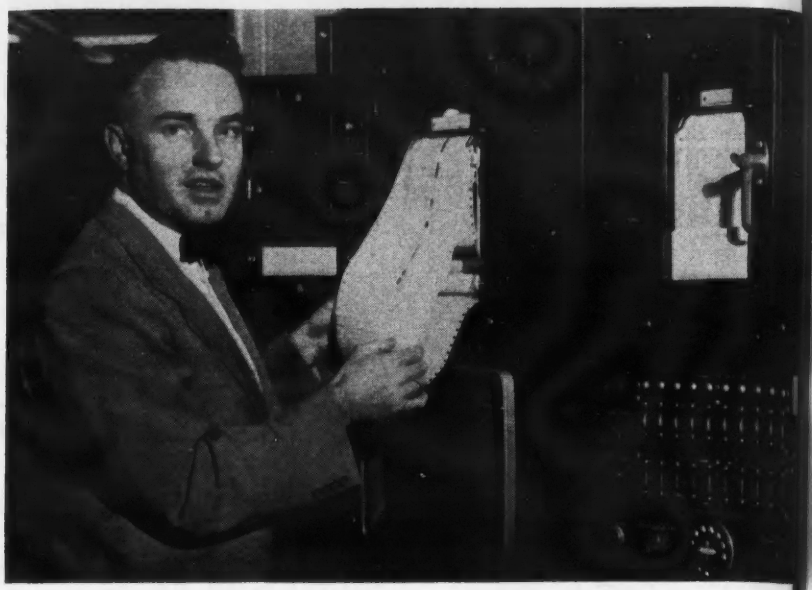


FRANK L. BONEM
Associate Editor

How to keep fingers on 'pulse' of plant operations

Seven graphic recorders at Reliable Packing Company keep management abreast of up-to-the-minute events

Fred DiPasquale, *hog-dressing superintendent, points out operation pattern to Frank Oswald, department foreman. All recorders at Reliable have 20 pens. Two units shown monitor all major operations in department including final weighing of "hot" carcasses at end of dressing operation*

FROM RECEIVING TO SHIPPING, operation-event recorders — which show when and for how long a machine is in operation or idle — play a major role in keeping Reliable Packing Co's executives, including young, energetic president and general manager, John E. Thompson, constantly informed of what is happening in plant.

At Reliable, seven of these graphic recorders help management cut costs by recording downtime of machines, product movement and temperatures. Recorders even help in cost accounting.

Operation of 40 major units is charted by twin recorders, see photos left, in hog-dressing department where animals

Watchdogs for busy executives, two 20-pen Esterline-Angus operation-event recorders mounted in twin case. Charts, marked with time of day, have rectilinear coordinates; can be synchronized for easy comparison of occurrence time of various events.

In general, operating elements of recorder consist of up to 20 electromagnets mounted on single back plate. Each magnet can be energized by variety of switches or contacts; in turn operates a pen writing on moving chart. Three different types of record patterns may be obtained: rectangular (shown), band and impulse pattern. Rectangular pattern is formed when some event occurs and electromagnet is energized, causing corresponding pen to move laterally 1/10 in. off its normal line. Pen remains in lateral position until magnet is de-energized. Impulse pattern, which is a series of thin, lateral lines, is produced when electromagnet is only momentarily energized. Method is suitable for counting slow operation sequences or product pieces

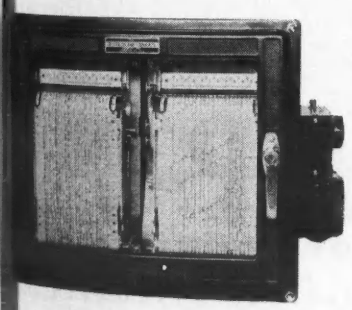
John E. Thompson, president and general manager of Reliable Packing Company, scans tape of one of two graphic recorders located on instrument panel immediately outside his office. Closed-circuit TV, inter-communication system and numerous temperature recorders (not visible) help monitor plant's departments and operations

are slaughtered. Similarly, recorders furnish information on machines in hog-cutting department and in rendering departments where lard and inedible fat are produced.

Downtime indicated by some of the operation-event recorders at Reliable is charted in minutes and leads to immediate investigation to determine whether a human shortcoming, a machine malfunction or an established procedure is at fault. The problem is studied and corrected when possible.

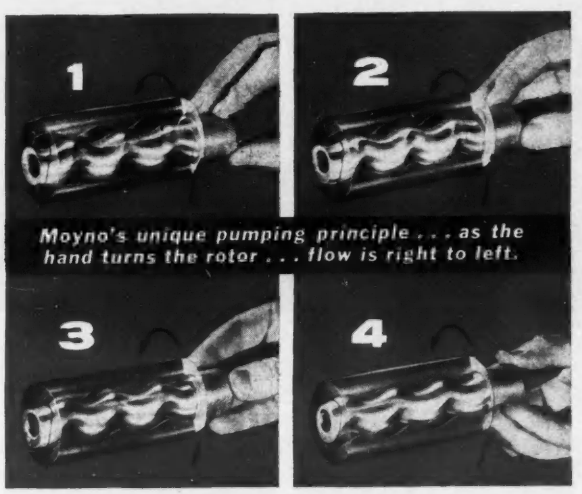
Recorder charts also reveal where and when persistent

Esterline-Angus Operation-Event Recorders are product of The Esterline-Angus Company, P. O. Box 596, Indianapolis, 6, Ind.
6760 on Reader Service Slip.



MOYNO® FOOD PUMPS *help the Green Giant keep the kernels whole!*

He's very fussy about the appearance of Niblets Brand corn, so Green Giant Co. uses Moynos to keep the tender kernels whole. Moyno's "progressing cavities" move all foods smoothly, without disintegration, pulsation, aeration or agitation! Variety ranges from thin soups to heavy peanut butter to chunky potato salad. Moynos keep foods pure, too! All wettable parts, except stator, are stainless steel. Stator can be stainless, synthetic rubber, odorless bakelite or other material. Smooth pumping elements can't lodge particles where bacteria might thrive. And Moynos can be dismantled, cleaned and be back on duty in minutes! Moyno food pumps are available in five sizes with capacities to 175 gpm and pressures to 75 psi. Write today for new Bulletin 100-FP.



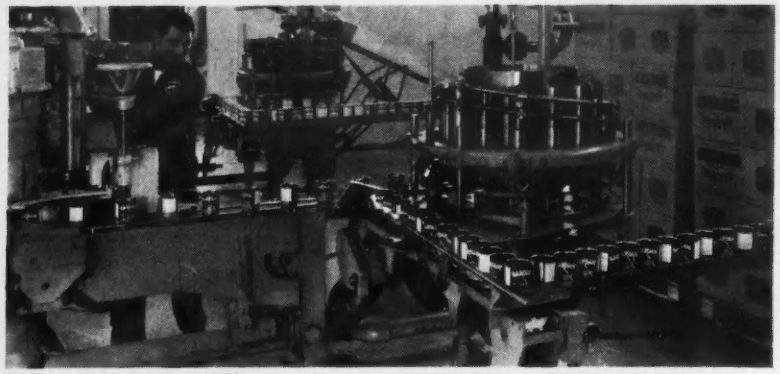
Moyno's unique pumping principle . . . as the hand turns the rotor . . . flow is right to left.

ROBBINS & MYERS, INC., Springfield, Ohio

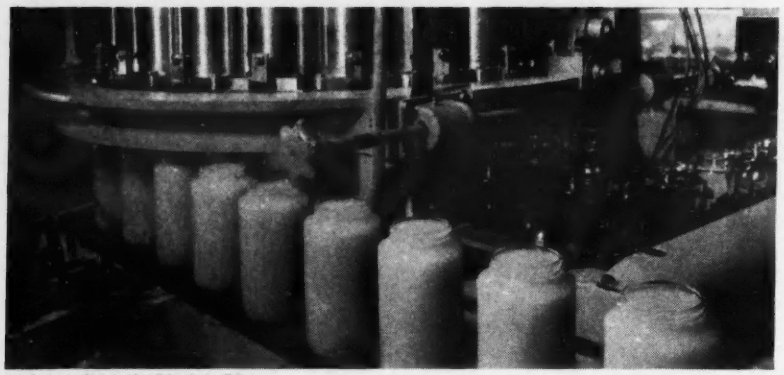
Fractional and Integral HP Electric Motors • Electric Hoists and Overhead Traveling Cranes • Moyno® Industrial Pumps
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

6761 on Reader Service Slip.

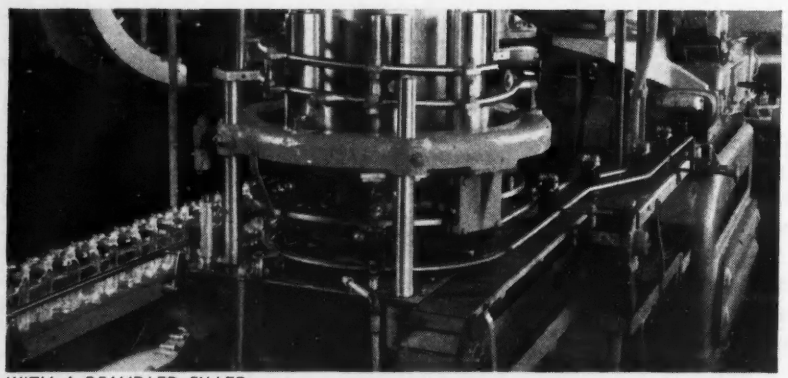
FLUIDICS AT WORK



WITH A PFAUDLER FILLER:
NO MAINTENANCE or parts replacement in two years at Bardahl Lubricants Inc., where two Pfaudler® Rotary Piston Fillers handle a variety of viscosities and container sizes.



WITH A PFAUDLER FILLER:
CONTROLLED "HEAD SPACE" every fill is what Duffy-Mott gets while handling 190 quarts of applesauce every minute. Accuracy is held to ±1/10 fluid ounce.



WITH A PFAUDLER FILLER:
VISCOUS HOT FUDGE is filled with speed and accuracy at the Robert A. Johnston Company. Six- or eight-ounce jars are filled at the rate of about 55 a minute.

More information? Write to Pfaudler Division, Dept. FP-121, Rochester 3, N. Y. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

6762 on Reader Service Slip.

trouble occurs, and how frequently it reoccurs. Thus, charts make it easy for management to schedule preventive maintenance to eliminate delays and improve efficiency.

Air temperature as well as carcass temperature in hog coolers are recorded by another unit. Meat temperatures are obtained by inserting thermocouples near aitch bones of several centrally located carcasses.

For correlation of all-important cooling cycle, another graphic recorder charts operation of refrigeration machines. Graphs from this unit show hours of refrigeration necessary to chill load in coolers.

Temperature graphs together with machinery graphs provide management with a clear picture of refrigeration necessary per cooler loading, and rate of chilling. Also, they quickly indicate any trouble in operation of compressors, condensers and evaporators.

Count of daily hog receipts is furnished by a recorder located at live-hog receiving area. When tabulated, count by this recorder furnishes a double check of printed weight records from production-line scales. By comparing hog counts, weights and other statistics, Reliable personnel can arrive at basic cost figures.

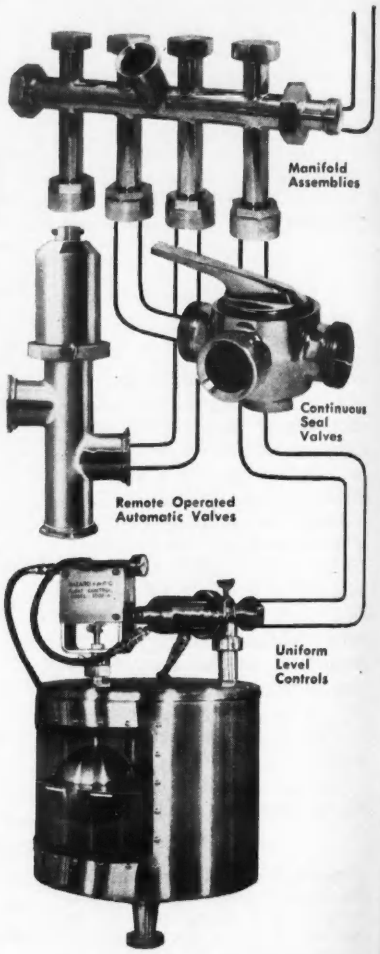
According to John E. Thompson: "The operation recorders help us to run as modern and efficient a meat packing plant as any in the nation." END

Improves proportioning of liquids to solids

Continuous, automatic system accurately proportions liquids to solids by combining continuous dry-material weighing with closed-loop metering of liquid additive. Fail-safe system — it automatically stops when either unit is empty — is subject of brochure "It's A Fact — There's A Better Way To Proportion Liquids To Solids."

Released by B-I-F Indus-

A-P-C
FLOW CONTROL components



From America's most completely integrated stainless steel component manufacturer. Prompt reply to your questions. Estimates and famous A-P-C engineering consultation are yours for the asking.

A-P-C
ALLOY PRODUCTS CORP.
1076 Perkins Avenue
WAUKESHA, WISCONSIN

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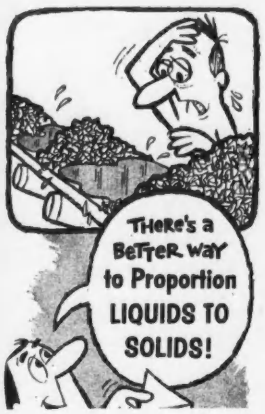
tries, 18-page brochure includes a two-page data sheet and pertinent bulletins on belt weigher and feeder. Literature



contains illustrations, schematic diagram of a typical installation, dimensions, description of operation, and uses and advantages of proportioning equipment.

Also available from B-I-F Industries is a similar 24-page brochure, "It's A Fact — There's A Better Way To Feed Molasses." Booklet is made up of two-page data sheet and four-page bulletin. There is also considerable application data. Materials other than molasses that can be fed with equipment are listed.

6764 on Reader Service Slip.

Blend own sweeteners in storage-blending unit

Combination storage-blending unit affords operating economies, greater versatility in blend selection, and control

within limits of less than ½ per cent in blending corn syrup and liquid sugar.

Unit, termed Stablend, is divided into three compartments to accommodate 4000 gal

Final separation and solubles washing is accomplished in this 9-stage DorrClone® system. Each of these clam-shell type separators contains hundreds of manifolded cyclone units.

HOW PENICK & FORD PRODUCES TOP-QUALITY STARCH WITH DORR-OLIVER EQUIPMENT

stages of continuous process include separation, concentration, clarification, degritting, washing, straining

Exceptionally pure starch is produced by Penick & Ford, Ltd. using a starch-gluten mixture derived from corn.

"Practically runs itself"—The separation process incorporates Dorr-Oliver equipment and "practically runs itself." Six major operations are performed by this system. Every detail is aimed toward high reliability to insure continuous operation. DorrClone separators, for example, fit perfectly into the picture because they are inherently reliable . . . contain no moving parts. Clarification of middlings product is carried out in Dorr-Oliver's new high-speed Model B-20 Merco centrifuges. Degritting of underflow from primary mercos takes place in a 20-unit two-stage P50A DorrClone system using large porcelain cyclones. Extra protection is provided by Merco® Rotary Strainers which remove tramp oversize particles. The system is carefully designed and instrumented to give maximum control of the starch product.

This modern plant is an example of accomplishment in food technology. Separation of a starch suspension is only one of a wide range of food and pharmaceutical separation problems you can solve with Dorr-Oliver equipment. If you'd like detailed information on our products—or assistance on a specific separation problem—drop a line to the Food & Pharmaceutical Division nearest you. Dorr-Oliver Incorporated, Stamford, Conn., 813 Merchandise Mart, Chicago, Ill., or 2900 Glascock St., Oakland, Calif.

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

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of corn syrup, 5000 gal of liquid sugar, and pump and controls.

Storage-blending unit, which is a modification of the Staport portable unit, is described and illustrated in four-page brochure released by A. E. Staley Manufacturing Co. Major components of a typical unit are listed and major dimensions are shown diagrammatically.

6766 on Reader Service Slip.

Worked examples show how you can figure

Heating and Cooling

Many food plants have heating (or cooling) equipment operating at a certain capacity under given conditions. Then, an increase in capacity may become necessary. The important question arises: will the machine handle the increased capacity or do we need additional equipment?

Management personnel of many food processing plants are often leery about doing heat transfer calculations. And, if extreme precision or sizeable investments are at stake, this is a sensible approach.

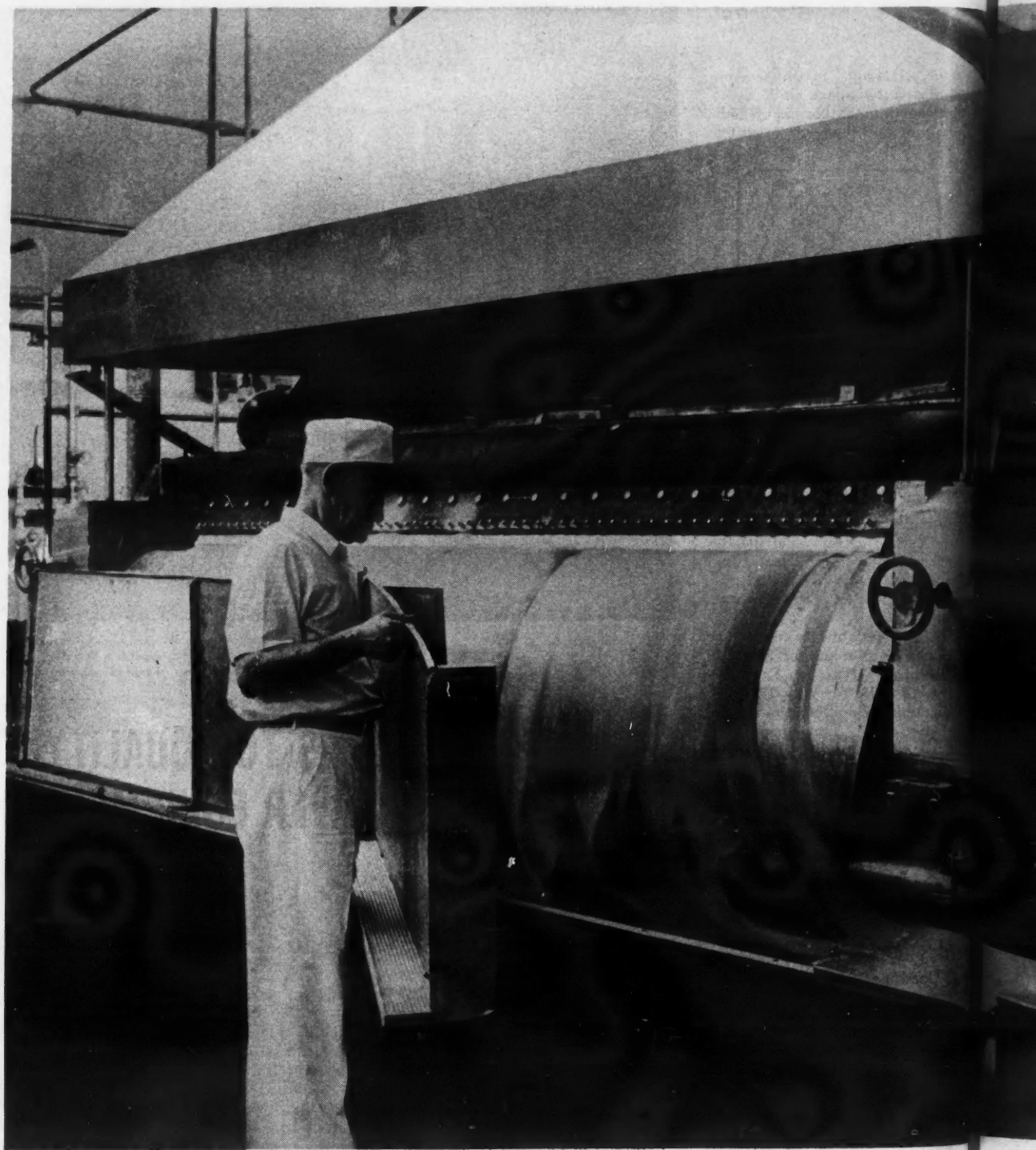
However, given commonsense and dependable information, simple arithmetic can solve many of the heating and cooling problems that come up, with sufficient accuracy for working purposes.

The dependable information needed by "do-it-yourself" calculators may be found in a 26-page Technical Bulletin 356, issued by Dean Products, Inc., the manufacturers of Panelcoils.

Panelcoils are heat transfer units formed by welding together two metal sheets, one or both of which may be formed with flow channels. The Panelcoils may be used on the inside or outside of equipment, and can be made an integral part of the equipment.

The particular value of the bulletin lies in the varied examples it contains, worked step-by-step.

Tables of general value include: industrial heat transfer



Dried baby cereal peels off a Buflovak Atmospheric Double Drum Dryer at the rate of 200 pounds an hour at the H. J. Heinz Company plant in Pittsburgh, Pa. This is the third they have purchased.

Our Customer Technical Service Laboratory solves a processing problem like this every day

57 H. J. Heinz improves production and quality of dried baby cereals... and lowers cost with Buflovak double drum dryers

H. J. Heinz Company, Pittsburgh, Pa., had the problem of drying baby cereals by a continuous, low cost method that prevented waste and maintained quality and production. The answer is a process that uses a Buflovak atmospheric double drum dryer to convert cooked cereals in liquid form to dry flakes ready for packaging.

The cereals may be oatmeal, rice, barley, or mixed cereals, but all must be handled carefully to prevent spoilage and retain minerals and vitamins that could be affected by excess heat. Fast drying is essential and Buflovak dryers provide that. The cereal is in contact with the drum for only 8 to 22 seconds at an average temperature of 293 degrees F.

A stainless steel, pendulum-type feed distributes the liquid cereal uniformly along the full 120" length of the 42" diameter drums. The thickness of the cereal film between the drums varies according to the solids content and is adjustable by means of spring loaded adjusting screws that control the clearance.

Approximately 200 pounds of cereal an hour can be dried by each dryer. In addition to operating advantages, the simplicity of design of Buflovak double drum dryers makes maintenance easy and speeds cleaning procedures.

Buflovak Customer Technical Service Laboratory selects proper equipment scientifically

Expert engineers test products and processes in pilot plants, work with your engineers, or develop processes and procedures to answer your problems, whether they pertain to dryers or other processing equipment. Buflovak makes a complete line of dryers, including atmospheric and vacuum types, with chamber, rotary, pan and other models. Because of this, Buflovak engineers can recommend impartially the unit that best meets your job requirements. This service is yours for the asking. It has helped many companies. It can help you, too.

Catalog 384 describes the Buflovak Dryer line. Catalog 381 describes the Laboratory. Or get a complete fact sheet on the Heinz dryer installation. Write today. Buflovak Equipment Division, 1559 Fillmore Avenue, Buffalo 11, New York.

Buflovak Equipment Division
BLAW-KNOX

BLAW-KNOX

Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms • Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes • Towers and Special Structures • POWER: Power Plant Specialties and Valves

6767 on Reader Service Slip.

factors ("U"-values); areas of piping and tubing; working capacities of Panelcoils; densities and specific heats of common substances, and heat-up surfaces to provide definite rates of heating.

Getting around the need for "higher" mathematics, a chart of logarithmic mean temperature differences is included.

The bulletin can be recommended to anyone who has, in the past, wished that he could do some rapid checking of heating and cooling needs.

6768 on Reader Service Slip.

Wiped film evaporator operation, maintenance detailed in bulletin

The evaporation of difficult liquids—heat sensitive, viscous, or low in thermal conductivity—is the specialty of wiped film evaporators.

Bulletin 1006, published by the Pfaudler Division, Pfaudler Permutit Inc., will be of interest to all companies that have such difficult liquids to evaporate. Much detail that does not appear in advertising literature is given.

The 8-page bulletin starts with a description of how the Pfaudler Wiped Film Evaporators operate. Then follows dimensional data, procedure for accepting shipment, handling precautions, notes on installation, operation and maintenance, and lists of spare parts by name and number.

6769 on Reader Service Slip.

Bimetal thermometers in general catalog

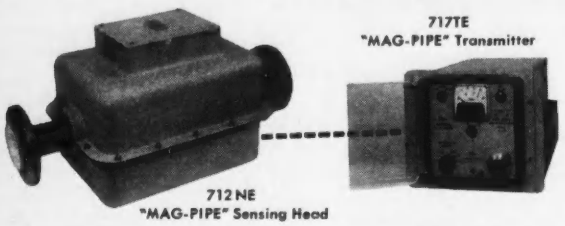
There must be very few food processing plants which do not—or cannot—use at least a few bimetallic thermometers.

A wide range of Weston bimetal thermometers, including specialized rugged industrial types for the food industry, is included in a 16-page general catalog just issued.

Bulletin No. 09-100, "Bimetal Thermometers", is available from the Weston Instruments Division, Daystrom, Incorporated.

6770 on Reader Service Slip.

NEW *Taylor* MAGNETIC FLOWMETER TRANSMITTER



For fruit juices, soups, pastes, purées, starches, milk, beer

Because the sensing element of the MAG-PIPE* Magnetic Flowmeter does not restrict flow, it ideally meets the sanitary requirements of the food industries. Sanitary pipe fittings also adapt it to Clean-In-Place systems. Check these features:

- 1-5 ma DC signals up to 10,000 ft. with ½% accuracy.
- Handles full-scale velocities as low as ½ ft./sec. with only slightly reduced accuracy.
- Measures flows with electrical conductivity as low as that of distilled water.
- Transmitter fully transistorized for long-term reliability.
- Rangeability is ½ to 30 ft./sec. full scale calibration.

Write for **Bulletin 98418.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Ontario. *Trade Mark

Taylor Instruments **MEAN ACCURACY FIRST**

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ARRICK
Floatless, Electrode Type
LIQUID LEVEL CONTROLS

give you all these advantages!

No moving parts in the liquid • Easy to install • No adjustments necessary • Unaffected by acids or caustics • Unaffected by pressure or temperature • Standard 2&3 pole units listed by U/L

Write for 32-page Catalog which gives complete specifications

Two pole control shown at left

YOU CAN USE OUR CONTROLS FOR:

- Single & multiple pumps
- Motor & solenoid valves
- High & low cutoffs & alarms
- Evaporators
- Pressure vessels
- Storage tanks
- Waste sumps

Special controls to custom requirements

CHARLES F. WARRICK CO.
1964 W. Eleven Mile Road, Berkley, Michigan
Dept. 15 Telephone JOrdan 4-6667

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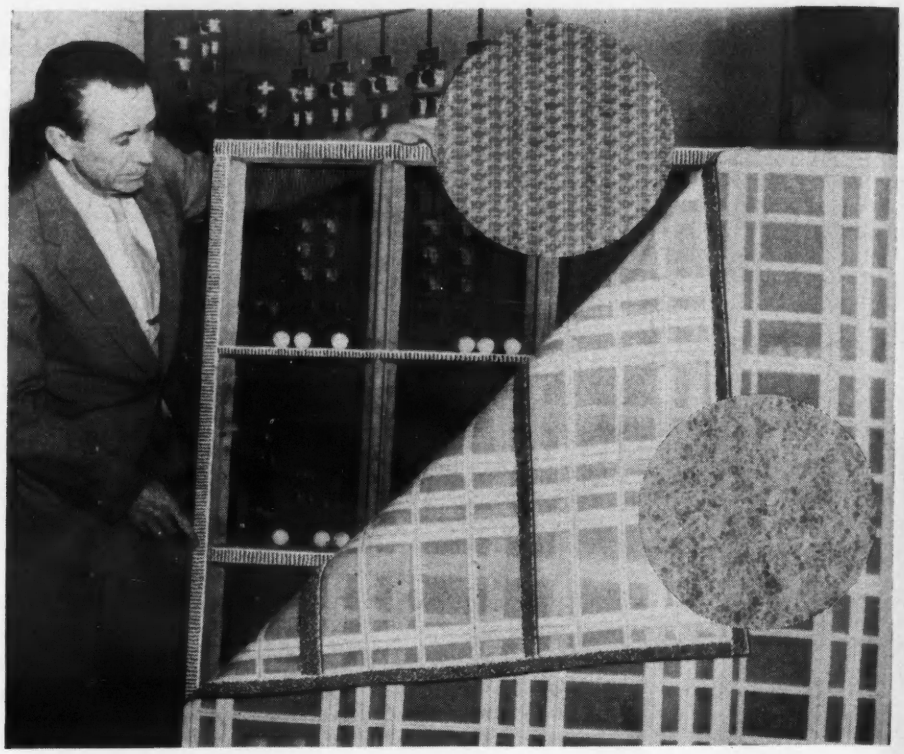


Quick change and inspection made possible. Note the even screen tension. Insets show close-ups of the two tapes—the upper of loops cemented to frame, the lower of heat-set nylon hooks sewn to screen. Two minute change by hand—no tools—peel off, press on

Peel off screen, press back on

Change sifter screens in two minutes, without tools

REFINED Syrups & Sugars, Inc. can now change screens on their sifters by hand in two minutes. They just peel them off and press them on. The Velcro fastener, a fairly new commercial product, makes this possible.

The Velcro system of fastening depends upon two special surfaces of fabric. One surface has a multitude of heat-set, semi-rigid nylon hooks. The mating surface is covered with looped piles of fabric. In combination, they act similarly to a burr clinging to cloth. To join, press together with moderate hand pressure — to separate, peel apart with an easy motion. The illustration shows how the screen would look while this is being done.

The tapes of Velcro-80 used by Refined Syrups & Sugars, Inc. were of an industrial type designed for heavy-duty work.

Used properly, over 30,000 cycles of opening and closing are possible with only a minor reduction of holding power.

Advantages. Refined Syrups & Sugars, Inc. observed:

1) More uniform screen tension because, compared to the point-by-point hold of tacks, the Velcro fasteners grip along their full length. A wide-jaw gripper is used to pull the screen into

continued on page 90

plants, companies, personalities

Bumble Bee Seafoods, Inc.

a subsidiary of Castle & Cooke, Inc., has purchased the Cambridge, Md., cold storage plant and warehouse of Consolidated Foods Corp. The plant had been used for production and storage of frozen vegetables. Consolidated Foods' Coastal Foods Division now is concentrating exclusively on canned soups and dried pack items — hence no longer required the plant.

Consolidated Foods Corp.

has signed an exclusive agreement with Dextra Corporation to manufacture and distribute Dextra Fortified Sugar in 11 western states. Special processing equipment is being installed at Consolidated's Union Sugar Division refinery at Betteravia, Calif. Production is expected to begin early in 1962.

Glidden Company

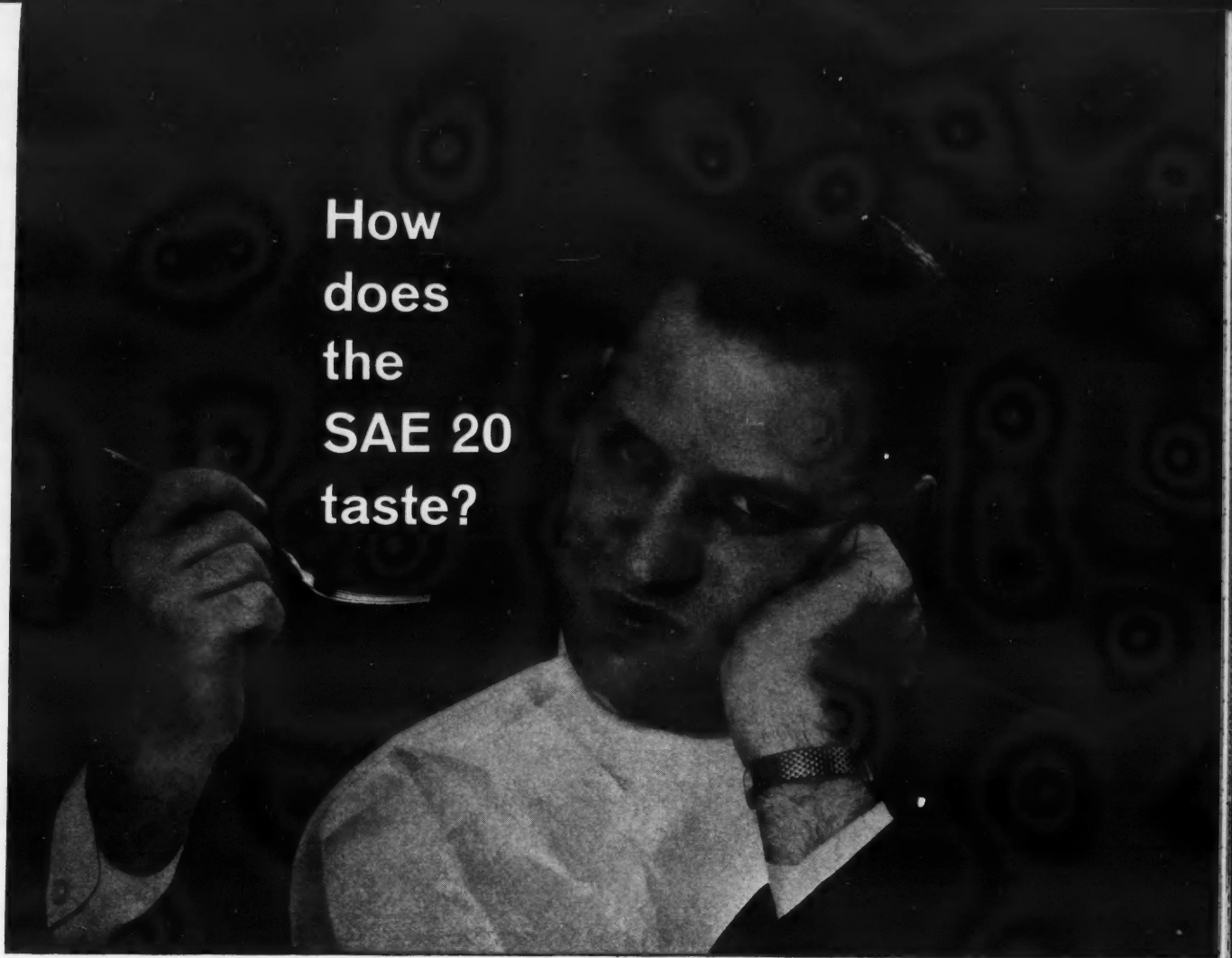
has appointed George F. Atkinson vice president and general manager of the Durkee Foods Group's Edible Oil Products Division. Succeeding him as manager of the Chicago Division of Durkee Famous Foods is Robert L. Klein.

Vietti Foods Co., Inc.

Nashville, Tenn., processor and packer of spaghetti sauce, beef and pork barbecue and chili, has doubled plant size to more than 15,000 sq ft., and added new stainless steel equipment. Company has plans to expand its current line.

A. Michaud Company

Philadelphia, has combined with Penn Valley Foods, also Philadelphia, to form the largest producer of portion-control meats in the East. Marvin Kramer and Oscar Zatz, key heads of Penn Valley, become, respectively, production manager of the Frozen Food Division and executive vice president in charge of sales of this division. President is Abner Michaud.



The slightest trace of lubricating oil, whatever its viscosity, is as deadly as poison in killing repeat sales of food products.

Oil contamination is a serious problem wherever compressed air is used for handling or processing foods — *unless* you have the proper compressor equipment engineered for oil-free operation by Ingersoll-Rand. The reputation of I-R compressors for reliability in heavy-duty service is unmatched on all types of jobs throughout the world.

Ingersoll-Rand builds the most complete line of equipment for oil-free compression of air or gas, including "NL" single- and double-acting reciprocating compressors, helical rotary Axi-compressors, and centrifugal compressors in a complete range of sizes. For more information, call your I-R engineering representative today. He can give valuable help on your job.

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

THE WORLD'S MOST COMPREHENSIVE COMPRESSOR EXPERIENCE

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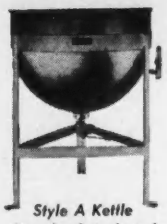
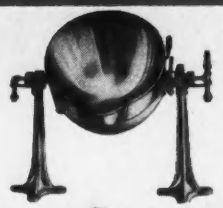
LEE Corrosion-Resistant PRODUCTS

For Reduced Processing Costs

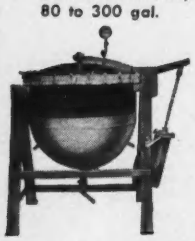
Style CW Kettle
Standard Jacketed,
80 to 300 gal.



Style A Kettle
Standard Jacketed
5 to 500 gal.

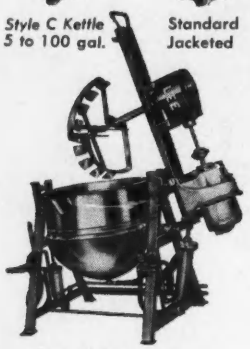


Style C Kettle
5 to 100 gal.
Standard
Jacketed



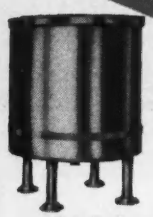
Pressure Kettle
Standard
Jacketed,
40 to 200 gal.

Style B Kettle
Full Jacketed, 10 to 300 gal.

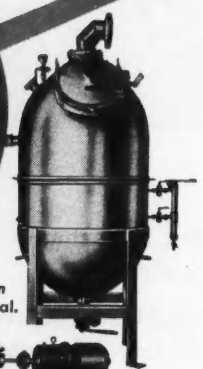


Style CW3T Kettle
with Center-Line Scraper
Agitator, 80 to 300 gal.

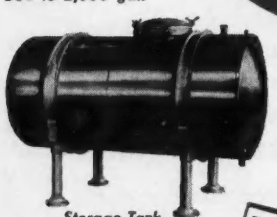
KETTLES
TANKS
PANS



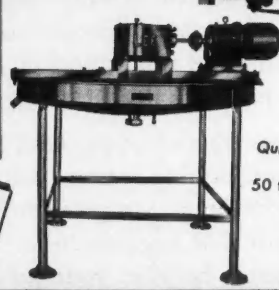
Pulp Tank
500 to 2,000 gal.



Vacuum Pan
30 to 500 gal.



Storage Tank
100 to 5,000 gal.



Quick Cooling
Pan
50 to 200 gal.

Write for bulletins on any of the products illustrated.

LEE Kettles

Kettles, Plain and Jacketed | Tanks, Processing and Storage | Agitators and Accessories | Vacuum and Pressure Equipment

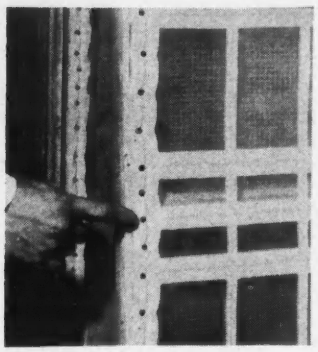
LEE METAL PRODUCTS COMPANY, INC.

A.S.M.E. CODE CONSTRUCTION AVAILABLE

414 PINE STREET, PHILIPSBURG, PA.

6774 on Reader Service Slip.

processing



Note "scalloped" edge of screen. Tack fastening led to uneven tension, chewed-up frames. Dislodged tacks and wood splinters could fall into product. Removal and replacement of screens took several minutes

place over the frame.

2) The frames, no longer punctured by tacks, last longer.

3) Dislodged tacks and frame slivers no longer find their way into the product.

4) The ease of screen changing makes more frequent inspection of the balls and sifter screens possible.

Information about the Velcro fastener and the adhesives used in this application can be had from the Velcro Corporation, 681 Fifth Avenue, New York, N. Y.

6775 on Reader Service Slip.

Fiberglas storage tank squeezes into place

Fiberglas reinforced plastic tanks have become increasingly common during the last few years. Reasons given include resistance to many common chemicals, including food ingredients, ease of fabrication, translucency to show level of contents and lack of need for painting.

That such tanks represent a flexible solution for bulk storage was shown quite literally by a recent installation of a 6500 gallon tank.

Problem #1: The elevator was somewhat too small to accommodate the sections, 4'6" X 6'6" diameter.

Problem #2: In moving to their destination, the sections

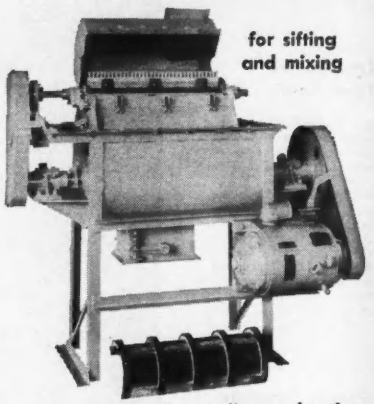
have a special **MIXING PROBLEM?**

SPROUT-WALDRON ADAPTIONEERED MIXERS

offer you

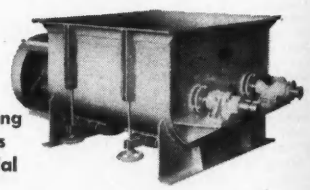
the right kind, the right size, the right style

and your **SOLUTION!**



for sifting and mixing

for cooling or heating while mixing



for handling viscous material

These three units are typical of many special mixers built with Sprout-Waldron Adaptioneering. Whether your mixing needs are standard or special—*check with Sprout-Waldron for economy and efficiency.* Ask for Bulletin 148.

623

SW SINCE 1866 **SPROUT-WALDRON**

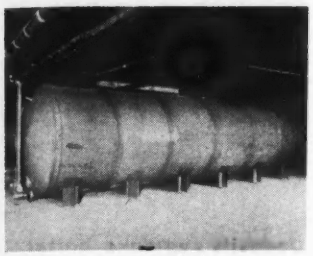
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

6776 on Reader Service Slip.

had to pass through a doorway whose larger opening was only 6'4" across.

Solution: Because of the lightness of the sections, it was possible to hoist them through the elevator shaft. Then, be-



Tank in place with only 1 inch headroom

cause of the inherent springiness of the material, the sections were maneuvered through the doorway by slightly flattening them during passage.

The finished tank stands in place with less than one inch of headroom remaining.

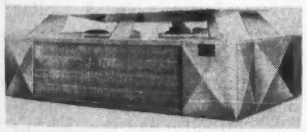
This tank was one of a line of bulk storage tanks now being offered by Jones & Hunt, Inc., Gloucester, Mass.

6777 on Reader Service Slip.

Cut cooler drafts with ceiling units

Uses-Features: For meat-cutting rooms, milk coolers and other applications where floor space is at premium, ceiling-mounted cooler unit is designed to deliver draft-free air circulation.

Cooler unit has heavy-duty fin coil for operating on am-



In ceiling units, 1/3-hp, single-phase fan motors are easily accessible by simply removing center pan

monia or brine, and has insulated pan to eliminate condensation.

Description: Ceiling unit cooler are defrosted by shutting off refrigerant; however,

HOW FMC CAN HELP YOU

FREEZE-DRY

FOR GREATER PROFITS

FMC's more than 70 years' experience in technological research and the design and manufacture of food preparation and processing equipment has been applied to the successful development of complete freeze-drying systems, now available for your production lines.

THE FMC FREEZE-DRYING SYSTEM ASSURES YOU OF:

Internal Condensing: Condensor plates are located inside the vacuum chamber. Moisture transfer is short and direct.

Labor Saving Through Efficient Product Handling: Unique FMC mobile platen car provides:

- ***Large Capacity*** – 500 to 1,000 square feet of drying surface, depending on product.
- ***Inherent Heat Application*** – Hollow product shelves serve as heating platens.
- ***No Product Thawing*** – Platen car is loaded in a cold room and moved to vacuum chamber immediately.
- ***Ease of Mobility*** – Platen car travels on rail system. Positive control of car and contents assured at all times.
- ***Minimum Product Handling*** – Platen car carries product throughout entire processing cycle. No product transferring.

Complete System: FMC's "package unit" includes all components required for complete plant operation.

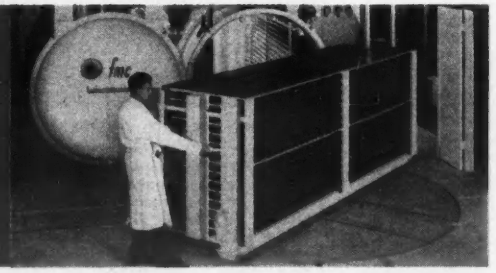
Fast Defrost: Minimum down-time between processes. Combined hot gas and steam purge systems rapidly defrost condensor plates.

Factory Service: "On the spot" service and consultation available from the manufacturer.

An informative brochure, "What's All This About Freeze-Drying?" is yours for the asking.

FMC's thorough experience and technical know-how is available to provide you with practical assistance in the application of an FMC Freeze-Drying System, to meet your particular requirements. Call your FMC representative or write us today.

FMC Freeze-Drying Systems are designed for cost-saving product handling as shown here by unique platen car on turntable, ready to enter vacuum chamber. FMC Freeze-Drying Systems are flexible, can be expanded by adding vacuum chambers to meet your growing requirements, without adding to common vacuum, refrigeration and heat systems.



FMC CORPORATION

CANNING MACHINERY DIVISION

GENERAL SALES OFFICES: WESTERN—SAN JOSE, CALIF. · EASTERN—HOOPESTON, ILL.

6778 on Reader Service Slip.

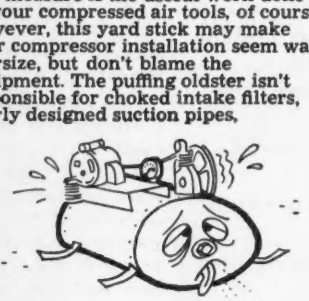
ONE OF A SERIES OF CHATS ABOUT THE CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

PREVENTION OF CRUELTY TO OLD COMPRESSORS

You've got at least one air compressor, of course. Doesn't everybody? And there it sits, pumping its heart out for you year in and year out. And you there, Simon Legree, do you ever give it a break and measure its capacity?

One measure is the useful work done by your compressed air tools, of course. However, this yard stick may make your compressor installation seem way oversize, but don't blame the equipment. The puffing oldster isn't responsible for choked intake filters, poorly designed suction pipes,



overcooling, undercooling, inadequate distribution mains and wet air. All these things can cost you.

Off and on we're going to talk about compressors in these pages, if you don't mind. It's a big subject and the lesson for today will be confined to the air intake. Can you imagine a more logical place to start?

Where to locate the intake? Easy. Where the atmosphere is clean and cool and dry. Dirty air and grit choke filters and eventually get through to cause wear. The cooler the air, the more you can compress per revolution. You'll get 10% more air delivered at 40°F. than at 90°F. And dryness is imperative, because compressed air can't contain all the moisture it can hold in its uncompressed state. Where does the moisture go? Into mains, tools, and valves, unless it's removed. And need we add that chemical fumes cause corrosion? That includes exhaust gases from engines and furnaces. CO_2 in the presence of oxygen and moisture can rust your valves, tools, nozzles and sprays.

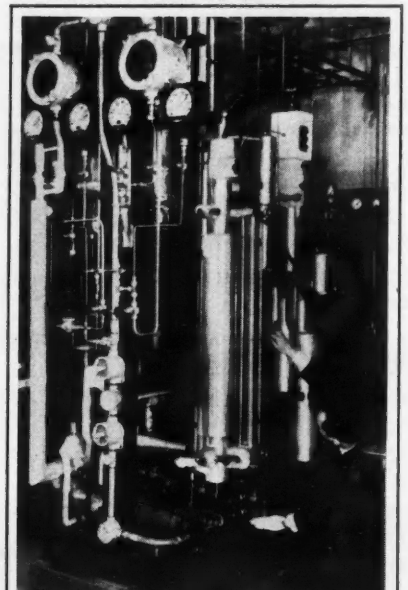
How about intake size? Keep pipes short, sized right, and straight as possible. Small pipes with snaky bends reduce pressure and capacity. For an educated example, a pressure loss due to friction in the intake pipe and filter of 2 psi (14.7 to 12.7) will reduce output of a 125 psi compressor by 7.5%.

How do we know so much? Well, as we continue in future issues, we'll be talking drains and traps and cooling and safety controls for compressors—all of which we manufacture. That's how we know so much. If you can't bear to wait, just write. It's that easy to get information out of us.

SARCO AND THE FLYING DUTCHMAN

In the pipe shop of a major office building complex on New York's east side, the Flying Dutchman flies again. This is really a bright idea which could well become standard practice elsewhere, because it's the kind of logical precaution that would make sense anywhere.

The chap in our photograph is putting together, according to precise, dimensioned drawings, an assembly consisting of a Sarco Thermo-Dynamic Steam Trap, Type TD-50, a Sarco strainer, and valves and fittings for stock. The assemblies will be used for quick and easy replacement in the event of failure or any possible maintenance requirement in the steam distribution system, the heating system, or the air conditioning system.

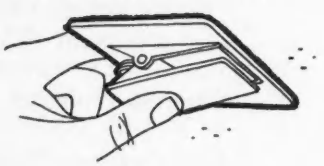


WORLD'S LARGEST ESPRESSO MACHINE?
No indeedy. It's a pilot plant Hydrofiner unit built by The Lummus Company at its Engineering Development Center in Newark, New Jersey. And its presence here is due to the fifteen ⅜" Sarco Thermo-Dynamic Steam Traps which vent and drain its 35 pound tracer lines plus a ½" TD-50 as a main drip. Nice to be picked for projects like this. Makes us proud.

We'd like to be able to report that this plan recently saved thousands of people from freezing or roasting during a crisis. So far, however, the assemblies have proved to be an ornamental kind of insurance policy. Alas, there have been no failures. That dog-goned Sarco performance is just too reliable for its own good.

WE'VE GOT THINGS TO GIVE AWAY

First of all, we have a new spring clip to hold together a bunch of papers on your desk, or something. It's not complicated, but it *is* difficult to describe, so we've gone to the tremendous expense of having our local Michaelangelo sketch it here. If you have no papers to hold together, it makes a rather delightful snapping noise that might amuse you. Oh yes—it also has a cross section of a TD-50 steam trap printed on it which actually *moves* when you wiggle your eyeballs at it. In case you *still* don't know how a TD-50 works, this is for you.



Second, we've still got engineers' sketch pads which we enjoy giving away so much we're offering them again. In case you're new here (Hello!) they contain isometric grid paper for use by anyone involved in piping or hookup sketches for process or heating applications.

And the famous Sarco key chain, which is really exactly that—a chain—about 60 times as handy as a fat case, we're offering again too. This has a TD-50 replica attached, but detachable. Call it tawdry promotion if you will, but our super-aesthetic wife wears one proudly around her neck.

All of these are available from your Sarco representative. Or, if he's out, write in.

There's really no reason to keep this conversation one-sided. After all, we're both interested in these subjects or you wouldn't have read this far. So write, even if it's only about a difficult problem. 7826

SARCO COMPANY, INC., 635 MADISON AVE., NEW YORK 22, N.Y.
STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

SARCO

6779 on Reader Service Slip.

units are suitable for defrosting by hot gas or water. A three-section sloping pan is incorporated for rapid drainage through large drain connection.

Units have welded coil which is hot-dip galvanized. Housing is made of enameled steel; is also available in stainless steel.

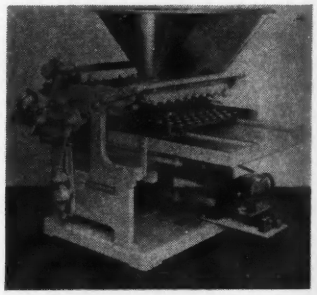
Supplier: Kohlenberger Engineering Corporation, 1600 Commonwealth, Fullerton, Calif.

6780 on Reader Service Slip.

Deposits cup-cake batter at 25 cycles/min

Features: Cup-cake depositing machine fills batter into pans at rates up to 25 cycles per minute; has separate piston-and-cylinder feed assemblies for each nozzle to attain high fill accuracy.

Machine can be fitted with batter or injection nozzles.



Cup-cake filler is equipped with 100-qt, SS hopper and is mounted on casters for mobility

When equipped with latter, baked cup cakes can be run through machine a second time for filling with jelly or creams.

Description: No. 3 Colton-Hope cup cake depositer is made with six-, eight- and nine-nozzles for simultaneous depositing of batter. Pans are automatically fed through machine for filling by walking-beam feed motion.

Drive for filling and for moving pans is powered by ¾-hp motor equipped with variable-speed V-belt drive.

Supplier: Arthur Colton Company, Division of Snyder Corporation, 3400 E. Lafayette, Detroit 7, Mich.

6781 on Reader Service Slip.

Problem materials custom-ground

Liquid nitrogen avoids oxidation, flavor loss

Pulverization of heat-sensitive, oxidizable and "problem" materials, including many food ingredients, has been carried out with the help of liquid nitrogen. The extremely fine particle sizes obtained without significant flavor or weight losses could produce interesting food applications.

Conventional grinding of spice materials often results in substantial flavor loss or change. Moreover, the coarse particles which result sometimes cannot do a satisfactory flavoring job without hurting the appearance of the finished product.

Ground ordinarily, nutmeg loses 4 to 8% by weight. With the aid of liquid nitrogen, there is no measurable weight loss. During this grinding there is no odor arising from the mill. This shows that the volatiles are retained.

The fibres of coconut meat can be eliminated while the flavoring potential is improved. Finely pulverized coffee beans could be interesting to processors of instant coffee and to the coffee vending machine trade.

The usefulness of liquid nitrogen is not confined to low temperature grinding. Being inert, the gas can furnish protection against oxidation when the grinding can be done at more normal temperatures.

Liquid Nitrogen Processing Corporation, of Malvern, Pa. report the foregoing and other experiences in their 4-page booklet, "Custom Grinding Services". A copy of this booklet is available on request.

6782 on Reader Service Slip.

HELP YOURSELF
For quick reference to new technical literature, see classified listing on page 114.

One of 38 Foxboro Cam-Set Schedule Controllers used to control temperature of fermenting tanks at the Pabst Brewery, Newark, New Jersey.

Foxboro Cam-Set Schedule Controllers protect the uniformity of Pabst Blue-Ribbon Beer

Ever wonder how they do it? Make every bottle of Pabst taste the same, look the same . . . batch after batch after batch. Experienced brewmasters — special yeasts are part of the answer. And strict control over time and temperature of fermentation are the rest.

For this strict control, Pabst Brewing Company, Newark, New Jersey, depends on Foxboro Cam-Set Schedule Controllers.

Here's how they do it. Operator installs proper cam for fermenting cycle, sets controller at "start," and that's it. Then, Foxboro takes over — automatically advancing tank temperature; automatically circulating refrigerant through tank coils when temperature of fermenting wort starts to rise. And when the cycle is complete, the operator has a continuous chart record of the whole process.

Foxboro Cam-Set Program Controllers deliver perfect uniformity, perfect repeatability, batch after batch. No wonder every bottle of Pabst tastes and looks the same.

If continuous temperature control is a problem on your food process ask your Foxboro field engineer about the Cam-Set Controller. Or write for engineering data sheet 208-3. The Foxboro Company, 9212 Neponset Avenue, Foxboro, Mass.

Two-case Foxboro Cam-Set Schedule Controllers are used on mash and cereal cookers at the Pabst Brewery. Two-case instrument allows changing charts without touching the cam.

FOXBORO
REG. U.S. PAT. OFF.

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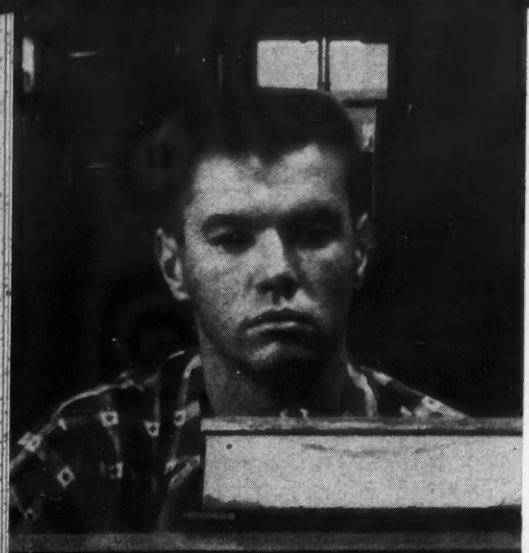
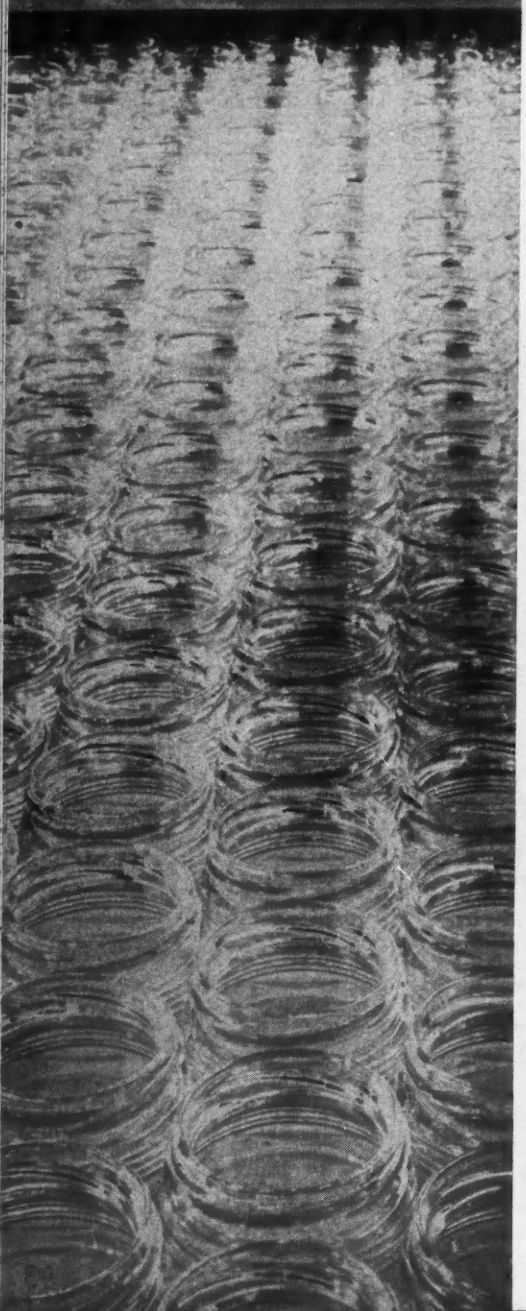


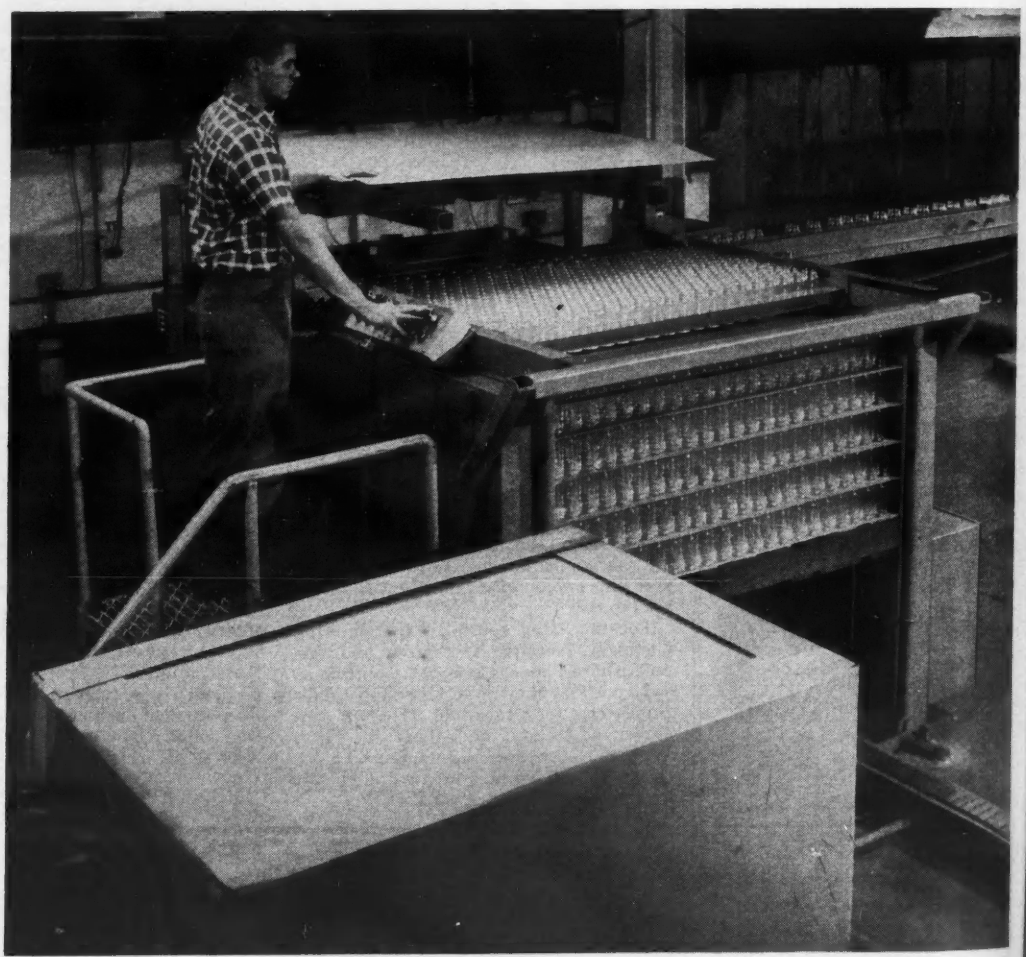


High-speed bulk palletizer for glass —

Breaks bottleneck

FP STAFF

Glass-container *bulk de-palletizing equipment, left, being prepared for moving bottles from pallets into production line for filling. Unit can discharge containers at rates up to* 1000 *per min. Palletizer, below, as it automatically completes racking and stacking glass containers on pallet. Unit accepts round-glass containers from single-file conveyor at speeds up to* 250 *per min and stacks them in tight, nested pattern on* 44- *by* 46-*in. pallet*



# of case-by-case handling

Now for first time, bottles can be produced, filled, multi-packed, stored and shipped — all without manual handling

SHIPPING 7000 glass containers as a single unit — rather than in case units of 24 bottles — is now practical with new, high-speed palletizing system.

As a result, processors who receive their bottles in bulk palletloads will enjoy two great advantages: 1) very fast unloading of incoming vans — up to 120 times faster than with unpalletized cases of bottles; 2) much better use of warehouse storage space — more than 50 per cent better space use than under present systems.

Further, bulk palletizing of glass containers will enable packers to separate purchase of cartons from the purchase of glass containers. Present-day production methods and practices of glass-container manufacturers usually dictates that glass containers be sold and shipped in the cartons in which packers will later ship them.

Thus, processors of glass-contained products such as baby foods, instant coffee and tea, soft drinks and beer can benefit by reduction in receiving-truck turn-around time, inventory of empty glass containers, requirements for cartons, operations involving unlabeled packed containers and deterioration of packed cartons in storage.

To facilitate introduction and efficient use of bulk palletization of glass containers by both, glass-container manufacturers and packers, methods for determining optimum pallet size and best pattern of loading for palletizing, handling, shipping, unloading, warehousing and de-palletizing are available END

High-speed bulk palletization of glass containers was first disclosed in a paper presented at the recent Glass Container Manufacturers Institute's Packing Seminar held at M.S.U.

Paper was given by S. J. Wallace of American-Wheaton Glass Corp., 221 N. La Salle St., Chicago 1, Ill. Company is developing a technical report on equipment that will be made available to interested persons.

6784 on Reader Service Slip.

Method of handling glass containers in pallets was developed by Emhardt Manufacturing Company's research and development facility, and field tested in Millville, N.J. at Avande Corporation, a joint venture of Emhardt Manufacturing Co., Portland, Conn. and American-Wheaton...

6785 on Reader Service Slip.

Glass *containers being depalletized by new automated equipment*

Helps meet AFDOUS Code

Container holds temp rise of −5 F foods to 4 deg for 24 hr at average 87 F

Container for bulk frozen foods has very high resistance to heat infiltration; will — according to recent test data — hold − 5 F foods below zero for 24 hours without mechanical refrigeration or dry ice.

Container's performance could have far-reaching ramifications in transportation and frozen-food industries, cutting handling at producer and retailer outlet level and minimizing refrigeration equipment in short-haul transportation.

Container consisting of an aluminum inner box and steel outer box, separated by two and one-half in. of foamed-in-place polyurethane foam, was tested at warehouse of Colonial Stores Inc., Columbia, S. C.

Container for frozen foods is 40 in. wide, 40 in. deep and 60 in. high. It can be fitted with any one of five different doors, and has clearance for fork-lift or hand-jack handling

Without cold-soaking container, 1012 lb of frozen foods ranging from orange juice to succotash were loaded at − 5 F. Unit was then fitted with temperature recording devices, closed, and taken to concrete loading dock exposed to sun.

Temperature at test location for 24-hr period averaged 87 F with a high of 100 F at 3 PM and a low of 70 F the next morning. At one point during test, outside surface temperature of container exceeded 125 F.

Temperature rise of frozen foods in container during 24-hr period was 4 degrees, tem-

"For greater economy and dependability... we're standardizing on Ford Super Duty tractors"

says Bert Caywood, Asst. Manager of Transportation, J. S. Dillon & Sons Stores Co., Inc., Hutchinson, Kansas

"Our Ford F-1000 Super Duty units gross 60,000 pounds and are doing an outstanding job in terms of operating economy and rugged dependability. We are in process of replacing all our older over-the-road equipment with Ford Supers as our new standard tractor.

"A good example of why we're changing is unit No. 15. This 1958 model, our first Super Duty, has now logged 137,202 miles without an engine overhaul. It still uses less than a quart of oil between oil changes and consistently averages about 5 miles to the gallon—under full load!

"Every driver that's been behind the wheel of a Ford has nothing but praise for the genuine performance of that powerful 477 Super Duty V-8. They maintain faster schedules because there's no wasted time creeping up grades in low gear, the way we did with former equipment—trucks that had a greater 'rated' horsepower.

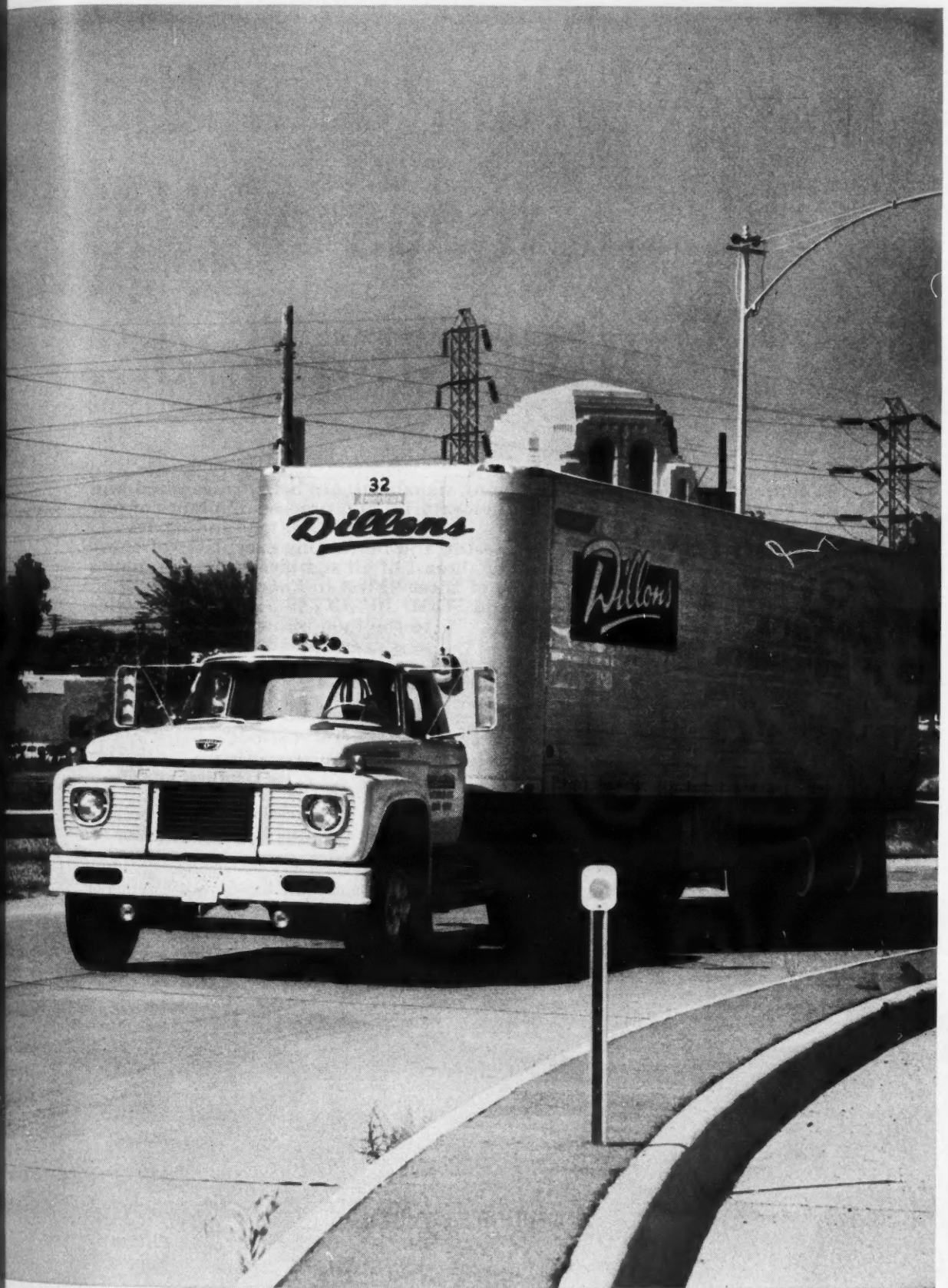
"Our drivers also enjoy Ford's greater cab comfort and riding qualities. They report better handling, very important with all the maneuvering that's necessary around loading docks at our food distribution center and retail stores."

Solid testimony that Ford's full-time economy only starts with low price!

FORD TRUCKS COST LESS

PRODUCTS OF Ford MOTOR COMPANY

6786 on Reader Service Slip.



perature at end of test period being — 1 F.

Container, called Avcold, has a capacity of 39 cu ft or 1500 lb of frozen food. It has been similarly tested by food outlets throughout the US.

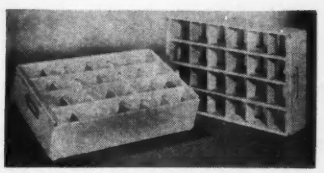
Supplier: Nashville Division of Avco Corporation, Nashville 1, Tenn.

6787 on Reader Service Slip.

Combination wood, fibre soft-drink case

Features: Soft-drink case that combines solid fibre and wood to attain maximum service and ruggedness at lower cost is lighter than traditional all-wood case. Made without wires, nails or banding, it eliminates possible injury to hands or clothes.

Developed after more than two years of laboratory work and extensive field tests, 24-Sell Shell, as the new case is



Combination wood-fibre case weighs about two pounds less than all-wood case of similar style and dimensions

called, offers almost unlimited color combinations for brand and advertising display.

Case can be filled automatically; cased, uncased and palletized on bottler's present equipment; and can be intermixed with wood cases.

Description: Half-depth 24-Sell Shell is designed to take bottles of 6½, 7, 8 or 10 oz. Similar case for 12-oz bottles will also be produced.

Cases are supplied with standard (kraft) or bleached solid fibre, or with solid colors. Wood is used for ends and for some partitions. Other partitions are of solid fibre (Fibreboard) as are sides, double-thickness bottom and exterior of each end.

Supplier: Container Corporation of America, 38 S. Dearborn St., Chicago 3, Ill.

6788 on Reader Service Slip.

Whatever the foods of the future may be...

. . . those future foods are today being visualized, are being researched and developed in the research laboratories and processing plants of our gigantic U. S. food industries . . .
. . . and the technologists, processing and marketing executives of these food industries are keeping abreast of all significant developments through their regular reading of these "First in Food" magazines . . . FOOD PROCESSING and FOOD BUSINESS . . . First in service to the food industries of America.

Feeding America's 180,000,000-plus mouths is a fabulous project in itself. But our food industries, while handling this assignment, are looking ahead to rapidly growing populations, to new types and kinds of foods to meet our ever changing environment.

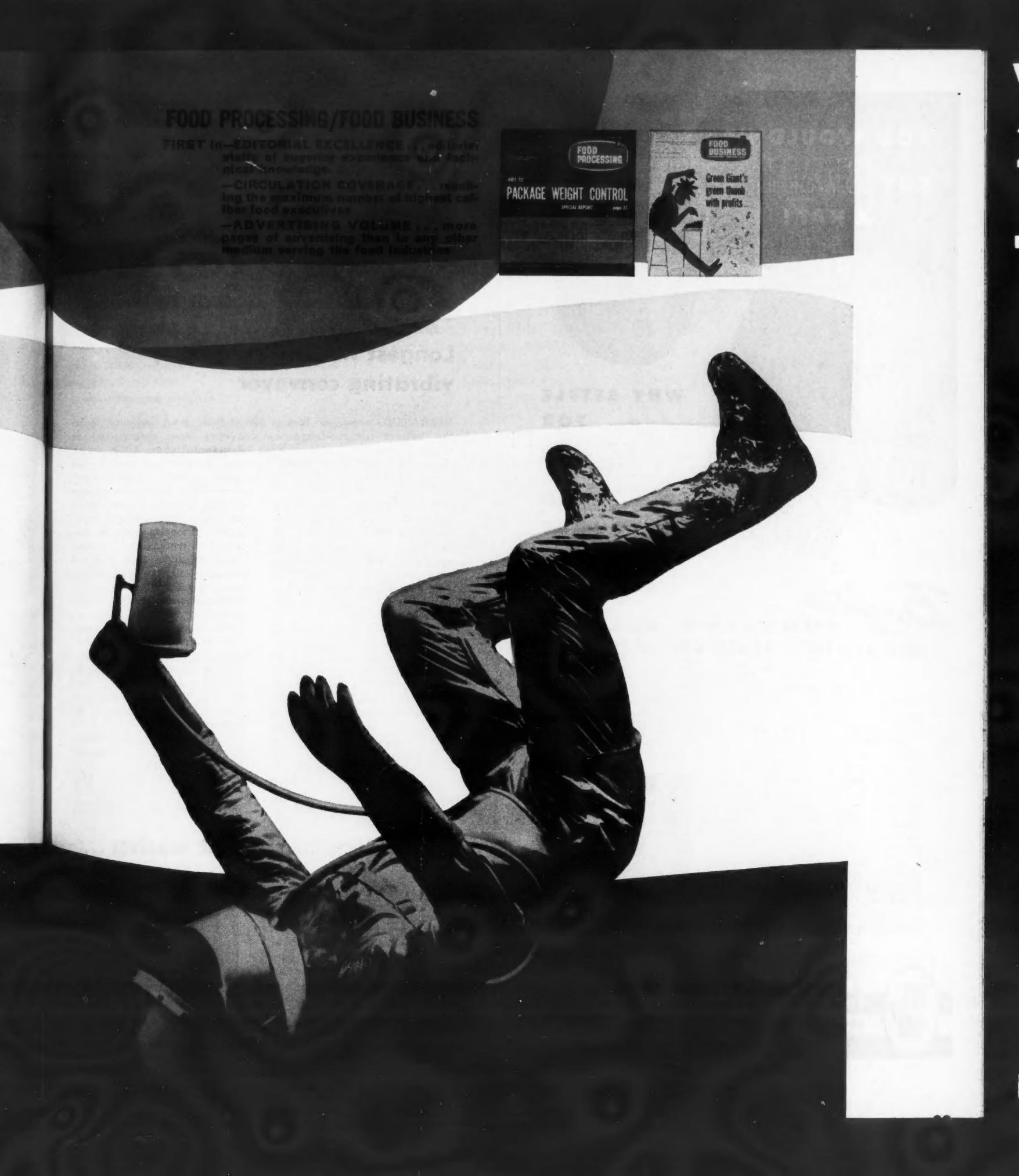
In these fast-paced industries, communication is vital. Technical processing and marketing knowledge must be translated and transmitted, accurately and significantly, to the executives who direct.

Here FOOD PROCESSING and FOOD BUSINESS render unequalled services . . . together, these two magazines serve *both sides* of our industries that feed us.

For there's a world of difference between creating, developing and producing the fantastic quantities of food our population demands . . . and the moving, displaying, marketing of this food to the homes and mouths of consumers.

It takes *2* magazines to do the job . . . and these two specialized, yet correlated, publications lead in serving those who do the specialized jobs . . . on both sides of the food industries.

PUTMAN PUBLISHING COMPANY
111 East Delaware Place Chicago 11, Illinois
also publishers of
CHEMICAL PROCESSING • QUEST . . . for tomorrow
WHAT'S NEW IN PLANT-ENGINEERING EQUIPMENT


FOOD PROCESSING/FOOD BUSINESS
FIRST in—EDITORIAL EXCELLENCE . . . editorial
staffs of superior experience and technical knowledge
—CIRCULATION COVERAGE . . . reaching the maximum number of highest caliber food executives
—ADVERTISING VOLUME . . . more pages of advertising than in any other medium serving the food industries
FOOD PROCESSING
PACKAGE WEIGHT CONTROL
SPECIAL REPORT
FOOD BUSINESS
Green Giant's green thumb with profits

WHY SETTLE FOR LESS WHEN YOU BUY CONVEYOR BELTS?

Buffalo CONVEYOR BELTS
offer you TRIPLE ADVANTAGES at LESS COST!

BUFFALO BELTS are 3 WAYS BETTER . . . deliver more conveying mileage for your dollar! (1) BW & B's *exclusive* WOV-IN-WEAR process weaves these belts TIGHTER for LONGER "fray-free" life. (2) These cotton belts have a "built-in bounce" that resists IMPACT and ABRASION. Nothing normally conveyed Digs, Dents or Destroys them . . . except Old Age! (3) Stiff, hard, plied-up belts which you may be paying a HIGHER price for *resists* rough spots or misalignments in your line . . . wear out fast. Buffalo Belts are extremely FLEXIBLE and when they come to bumps or misalignments, they merely MOLD AROUND or OVER and keep on going without abrasive wear.
Don't settle for "half value" . . . get the prices and the pluses of BUFFALO Conveyor Belt. 200 sizes, 35 widths, and 7 thicknesses.

6 SPECIAL SURFACES
Belts specially treated to resist weather, water, acid, oil, grease, alkalies, high or low temperatures, extremely rough material or to handle pure food.

WRITE FOR 14 PAGE MANUAL
Prices, pictures and practical suggestions on what belt to choose from our complete line.

BUFFALO WEAVING & BELTING CO., INC.
204 CHANDLER ST. • BUFFALO 7, N. Y.
We also manufacture a complete line of WEBBINGS and PURE SHEET RUBBER

6789 on Reader Service Slip.

Longest natural-frequency vibrating conveyor

VIBRATING conveyor that is 298 ft-8 in. long, believed to be the longest natural-frequency conveyor ever constructed, is shown assembled on shop floor of manufacturer. Unit, which moves materials with a gentle tossing and catching motion, has a capacity of six tons per hr and a surge capacity of 36 tons per hr.

Conveyor vibrates, and thus conveys, at same rate throughout its entire length. It uses natural frequency of coil springs to supply most of energy required for operation. (Natural frequency, or resonance, of all springs is the same.)

For installations where it may be desirable to vary conveying speed, as in drying, cooling, de-watering, bagging or packaging operations, manufacturer has developed a natural-frequency vibrating conveyor with variable-stroke positive drive.

Providing infinitely variable speeds from zero to maximum, conveyor drive can be adjusted either remotely or manually, even while in operation. Since motion is imparted to trough by a positive eccentric drive that will not dampen out or lose stroke, speed is controlled accurately regardless of conveyor length or loading.

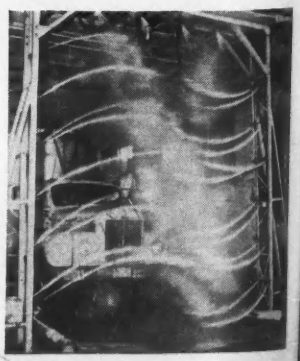
New conveyors are available with patented dynamic balancing which, for all practical purposes, eliminates vibration transmission to mountings or floor. Also, it makes possible cable-suspended installations.

Supplier: Stephens-Adamson Mfg. Co., 11 Ridgeway Ave., Aurora, Ill.
6790 on Reader Service Slip.

Oscillating truck-fleet washer...

. . . is designed for washing vehicles of irregular configuration, such as tank trucks or dump trucks, where brush-type washers would not be practical. It can also be used on panel trucks and other flat-surface vehicles.

Termed Oscillaspray, washing system consists of pre-wet spray arch, oscillating detergent-spray arch and rinse arch. Center arch, which moves up and down along side truck, has nozzle arrangement



specially engineered to oscillate at high speed. Developing nozzle pressures from 100 up to 600 psi, sprays "scrub" trucks.

Detergent mixing and storage tank for center spray arch and control equipment for automatic operation are included with system.

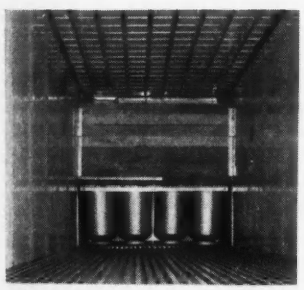
Supplier: Ross and White Company, 50 W. Dundee Road, Wheeling, Ill.

6791 on Reader Service Slip.

Ships fresh meats cross country with liquid-nitrogen system

First operational equipment using liquid-nitrogen refrigeration system, Polarstream, is being used initially to piggyback fresh meat for Armour & Company and other meat packers overnight from Omaha to Chicago, and through connecting service to Eastern Seaboard points.

With the liquid-nitrogen spray system, meat can be refrigerated automatically in 40-ft container-trailer units without in-transit attention for up to eight days. Precooling of



Four 370-lb capacity liquid nitrogen cylinders installed in a 20-in. deep section at head end of 40-ft trailer-container. Eight tubular rods running full length of roof are for hanging meat carcasses; single perforated pipe which sprays liquid-nitrogen cooling vapors throughout runs parallel to center rod

trailer units is not necessary, since desired in-transit temperatures, in this case 35 F, are attained by Polarstream units in less than five min.

New trailers and containers save more than a ton in gross weight. Also, since cold-air

"Our USS Cyclone conveyor belts have paid for themselves many times over,"

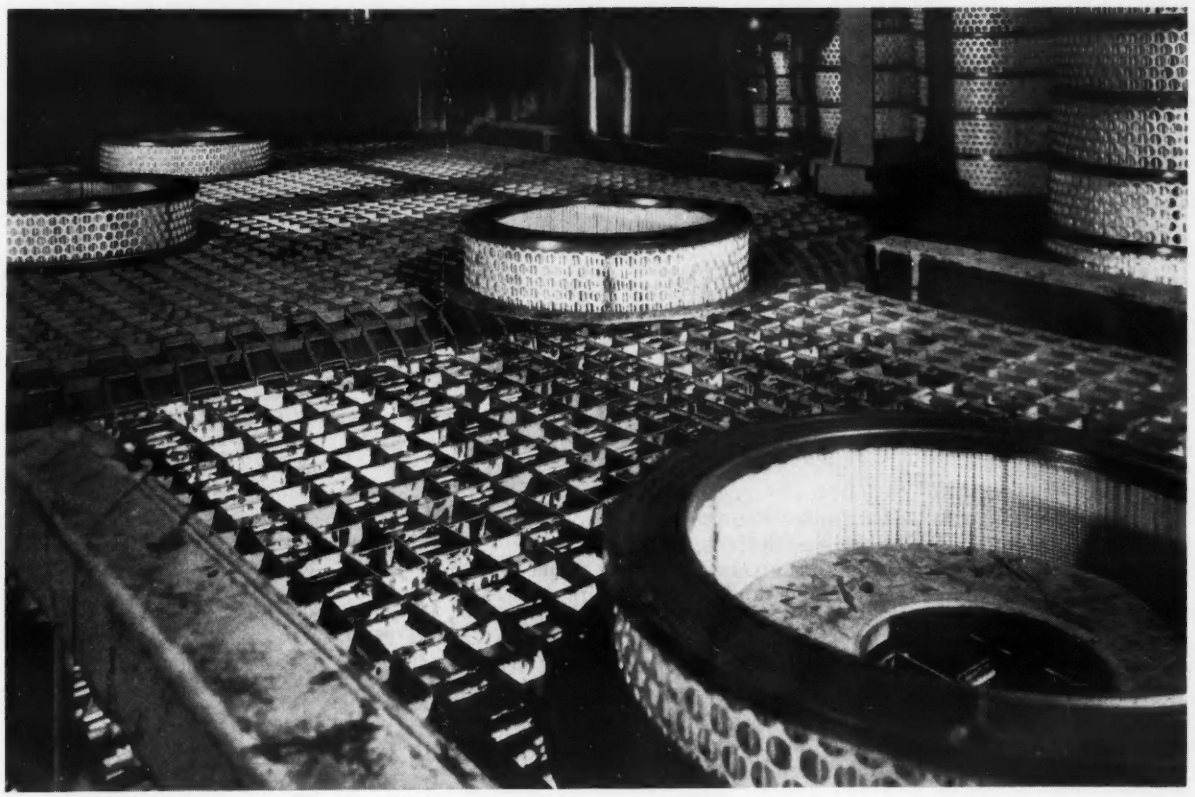
says Herb Otto, vice-president and chief engineer, Lee Filter Corp., Edison, New Jersey

"Conveyor belts are the blood lines of our filter production setup. If they go down, we're dead. Every year 20 million dollars worth of filter business rides on the ability of these belts to keep rolling. In five years Cyclone flat wire belts haven't let us down. We expect a lot from them. They've got to keep moving 16 hours a day, 12 months out of the year. Our belts are sprocket-driven and we've had little or no maintenance on them. We feel our Cyclone flat wire belts have paid for themselves many times over."

Chances are Cyclone has a belt which could improve your production. USS Cyclone makes more kinds of metal conveyor belts than anyone else in the world. Our service is the fastest in the industry. We have 66 branch offices around the country to serve you. Wherever you are, we're reasonably close. Next time you need a metal conveyor belt recommendation, give us a call. Check your Yellow Pages under "Conveyor Belts—Metal."

USS and Cyclone are registered trademarks

This mark tells you a product has the dependable strength of Steel.



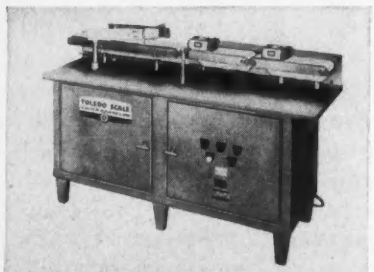
American Steel and Wire Division of United States Steel

Cyclone Sales Offices Coast to Coast

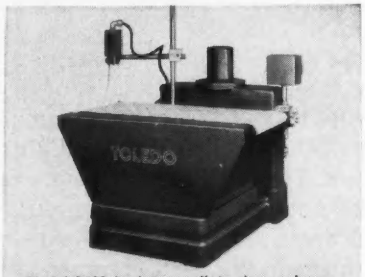
6792 on Reader Service Slip.

TOLEDO BRINGS YOU UNCHALLENGED

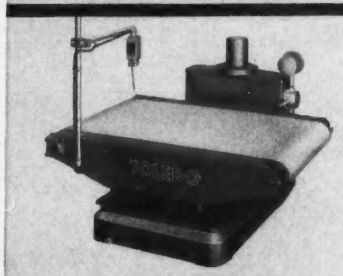
CHECKWEIGHING ACCURACY



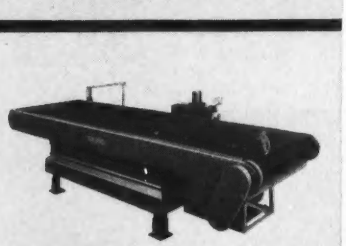
Model 9457 for small packages
2 oz. to 50 oz. capacity



Model 9463 for intermediate size packages
2 lb. to 25 lb. capacity

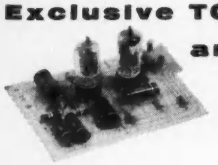


Model 9460 for heavy-duty
25 lb. to 250 lb. capacity



Model 9465 for items of exceptional length
10 lb. to 100 lb. capacity

Exclusive TOLEDO phase-sensitive, plug-in amplifiers are totally unaffected by voltage fluctuations... assure repeatable accuracy



Now you can have full-time protection against under-weight packages, customer complaints and restrictions on product sales. Put a Toledo 100% In-line Checkweigher on the job. New phase-sensitive amplifiers, an exclusive Toledo development, maintain stable operation independent of plant voltage fluctuations.

Toledo Checkweighers reflect the *most advanced* concepts of scale, material handling, and control engineering. They are compact, free of complex mechanisms and fit easily into most of the widely used conveyor systems. Zone Edge Tolerance is ±1/32 oz. in smaller capacity units to ±¼ oz. in larger models.

FOR VALUABLE INFORMATION ON TOLEDO CHECKWEIGHERS, AND RELATED ACCESSORIES, ASK FOR BULLETIN 2968.

TOLEDO® *Prime source for weighing technology and equipment*

TOLEDO SCALE, Division of Toledo Scale Corporation, 1419 Telegraph Rd.
Toledo 12, Ohio
(TOLEDO SCALE CO. OF CANADA, LTD., WINDSOR, ONTARIO)

6793 on Reader Service Slip.

circulation space is no longer required, greater payload can be carried.

Liquid-nitrogen refrigeration system, described in detail in July FOOD PROCESSING, pages 96 and 97, is being installed in new types of all-purpose refrigerated semi-trailers and demountable containers which R E A Leasing, division of R E A Express, has started to make available on a nation-wide basis.

Polyurethane-insulated, 40-ft aluminum container demountable from bogey trailer chassis, is a product of Railiner, Inc., Empire Building, Birmingham, Ala.

6794 on Reader Service Slip.

Semi-trailer equipment is made by Freuhauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich.

6795 on Reader Service Slip.

Installation of Polarstream system is performed by Linde Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N.Y.

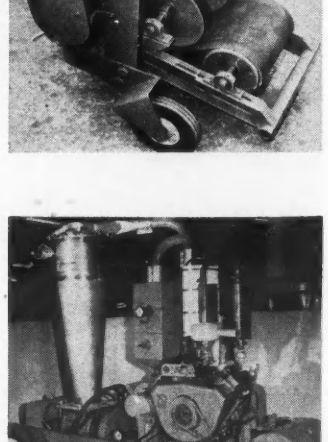
6796 on Reader Service Slip.

Three mobile aids for bulk transfer

Buhler Corporation, Materials Handling Division, Minneapolis 26, Minn. is manufacturing two pneumatic conveyor units that have positive-displacement blower and automatic shut-off device.

Rated at 10 and 25 tons per hr, units are equipped with built-in fuel tank sufficiently large for 8-12 hr of non-stop operation. Industrial gasoline engine is standard equipment, but diesel engines or electric motors can be supplied.

6797 on Reader Service Slip.



Fort Worth Steel & Machinery Co., 3600 McCart St., PO Box 1038, Fort Worth 1, Texas, has developed a unit that throws up to 8,600 cu ft of material per hr up to 25 ft high and with radius up to 50 ft.

Type CWM Speed Loader, as unit is termed, throws material in compact stream with endless conveyor belt traveling at high speed. Direction of throw and angle of trajectory are adjustable while loader is operating.

6798 on Reader Service Slip.

Sprout, Waldron & Co. Inc., 130 Logan St., Muncy, Pa., is offering a positive and negative pressure, gas-engine driven, pneumatic conveying system for transferring granules or powders. Unit is also available with electric-motor drive.

6799 on Reader Service Slip.

Association News

Sugar Research Foundation, Inc.

New York, has budgeted $300,000 for 1961-62 for 25 research projects in food technology and sucrochemistry. Studies in food technology will measure effect of a balance between sugar and other taste factors on consumer acceptance of foods. Specific foods include canned and frozen fruits, tomato catsup, frozen lima beans, ice creams, candies. Meat curing is an additional field.

American Society for Testing and Materials

is official new name for the former American Society for Testing Materials, Philadelphia. Inclusion of the word "and" in the Society's name places added emphasis on the organization's research work in seeking knowledge of the nature of materials.

The Chicago Dairy Technology Society

has selected as its annual $2000 scholarship award winner Michael Lindquist of Bark River, Mich. He will study dairy technology at the college of his choice — Michigan State University.

The Institute of Sanitation Management

has as new president-elect George B. Wagner, director, Economic Biology Dept., The Pillsbury Co. Named to head the Institute's Food Processing Division was Vincent J. DelGuidice, Armour & Co., Chicago. Division vice chairman is I. H. Goldenfield, Atlantic Gelatin Division, General Foods, Woburn, Mass., and division secretary is Clayton L. Baldwin, Jr., Sunkist Growers, Inc., Corona, Calif.

For more information on product at right, circle 6800 see information request blank opposite last page.

Hertz Customer—Snow-Kist Frozen Food Corp., Jersey City, N. J.

HERTZ gets you out of the Truck Business . . . and back into the Grocery Business!

Every hour spent on truck problems and administrative details is an hour *better* spent in promoting your own business. This is why more and more companies today are switching to Hertz Truck Lease Service!

Hertz pays cash for your present trucks. Then you take your choice of new GMC, Chevrolet or other sturdy trucks. Or your own trucks can be reconditioned and leased back to you. Instead of many separate bills, you pay just one check per week—and that covers everything except the driver.

Hertz Truck Lease Service includes complete maintenance, gas, oil, garaging, emergency road service, painting and lettering of trucks plus all administrative details such as licensing, insurance—and much more!

The service is *flexible*—trucks are custom-engineered, for example, to suit any kind of business. Should a truck be tied up for repairs, Hertz provides a replacement. Or if extra trucks are needed for peak periods, Hertz supplies them immediately. Get out of the truck business today! Call your local Hertz Truck Lease office for more information or write for booklet—"How to Get Out of the Truck Business."

No investment . . . no upkeep

LEASE HERTZ TRUCKS

HERTZ ALSO RENTS TRUCKS BY THE HOUR, DAY OR WEEK

HERTZ TRUCK LEASE, Dept. N-12
660 Madison Avenue, New York 21, N.Y.
Please send copy of booklet—"How to Get Out of the Truck Business" to:

NAME_____

POSITION IN COMPANY_____

COMPANY_____

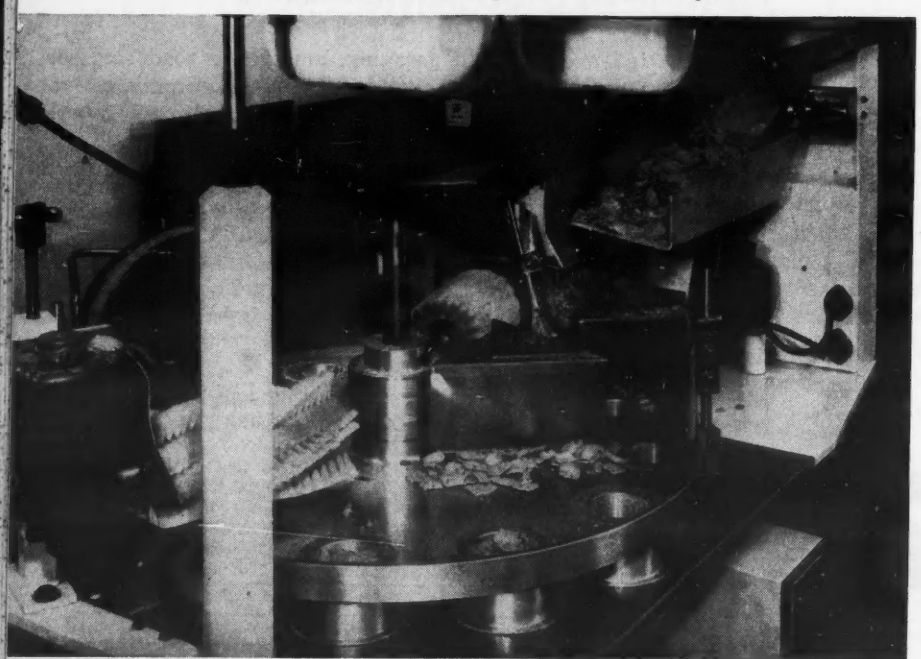
ADDRESS_____

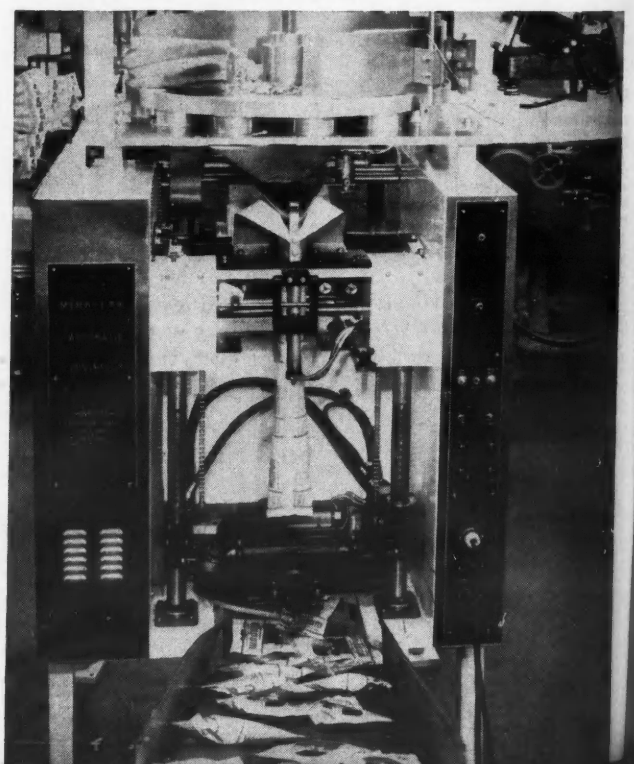
CITY_____ ZONE_____ STATE_____

▲ **62 pouches a minute** *are formed, filled with corn chips and sealed by the packager at left. Closeup photos below show construction and operating details of the packager*

Operating controls *are grouped on panel at right. Both side panels are hinged for easy accessibility* ▼

▼ **Brushes** *distribute chips into volumetric pockets*



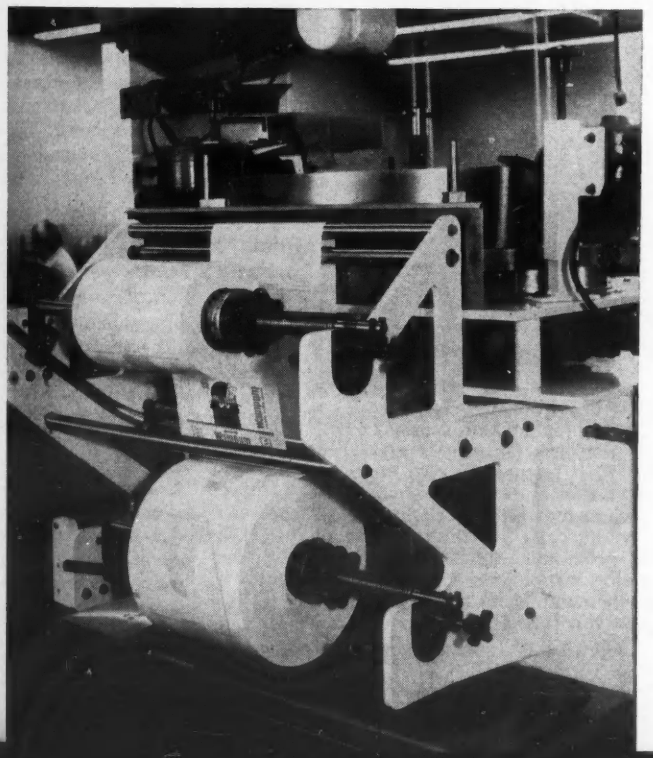


From bag to pouch — 2/3rd reduction in labor cost

Forms from roll stock, fills and seals fragile chips, at labor cost of 1.2c/lb vs 3.97c before

GEORGE JEPPSSON, Plant Manager
Scudder Food Products, Inc.
KARL ROBE, Associate Editor

Pouches *are formed from two rolls of wax-laminated glassine, lacquered on both sides*



PROBLEM: Fragile corn chips formerly were filled into premade bags which were opened and manually placed on clips below filling spouts on a revolving turntable filler.

At Scudder Food Products, Inc., Anaheim, Calif., costs for filling five-cent size bags on this type semi-automatic line averaged $5.64/hr. Method to reduce this cost-squeeze was sought.

Solution: Corn chips are automatically packaged by machine which forms pouch from roll stock, fills chips, seals and discharges finished packages for casing.

Former-filler machine was specifically designed to handle products such as potato or corn chips which are fragile and easily damaged by mechanical handling.

Units at Scudder Food Products feed chips onto turntable containing 12 pockets. Brushes distribute chips into pockets which discharge volumetrically into each pouch as it is formed.

One screw adjustment raises or lowers turntable to adjust volume of telescoping pockets for package weight control. Each of two brushes is likewise adjusted by hand screws.

Electrical temperature control system is easily accessible along one side of machine.

Results: Labor expense for filling has been reduced from $5.64/hr to $1.88/hr based on initial operating figures for five-cent bags, at rate of 62 bags/min.

This allowed Scudder to enter the corn chip market on attractive competitive basis which would otherwise have been unfeasible.

Laminated glassine packaging material is product of Crown Zellerbach Corp., Western-Waxide Division, 2101 Williams St., San Leandro, Calif.

6801 on Reader Service Slip.

Mira-Pak Series 8000 packaging machines are developments of Mira-Pak, Inc., P.O. Box 14019, Houston 21, Texas.

6802 on Reader Service Slip.

OUT-OF-SIGHT

Waste and Refuse Storage for Your Plant

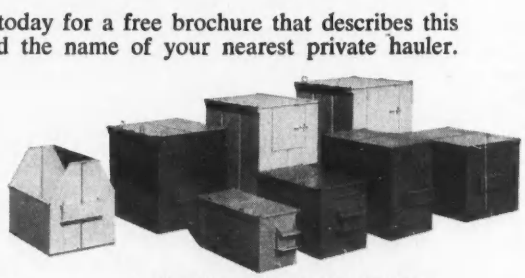
Plant-Owned System or Private Hauler Service Cuts Your Costs... Eliminates Unsightly Trash Piles

If trash piles, battered cans, scattered refuse, fire hazards and hit-or-miss collection are present in your plant, it may pay you to investigate the DEMPSTER-DUMPMASTER System.

You can own your own system or secure this vital service without capital outlay from one of the many Dumpmaster-equipped private haulers who operate in most major cities.

Clean, big-capacity containers, spotted at refuse accumulation points throughout your plant, provide enclosed, out-of-sight storage for waste and refuse, increasing plant cleanliness and improving employe morale.

Write today for a free brochure that describes this system and the name of your nearest private hauler.



ONE OF THE DEMPSTER DUMPSTER® SYSTEMS

FREE BROCHURE

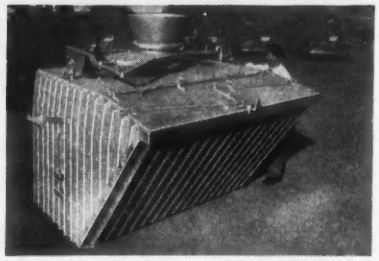
Write for Name of Your Nearest Private Hauler

DEMPSTER BROTHERS Inc.

Dept. FP-12 KNOXVILLE 17, TENNESSEE

6803 on Reader Service Slip.

NEW PRODUCTS



CONTAINER FOR HOT MATERIALS

This 6 cu. yd. tilt-type container was specially built to store and handle a high-temperature dusty product. It has cooling fins, a counter-balanced spring-hinged lid and a 16" sliding gate valve. When full it is picked up, hauled and emptied by a Dempster-Dumpster. Details are contained in a free brochure entitled "Special Containers." Dempster Brothers, Inc., Knoxville 17, Tenn.

NEW LFW HANDLES CONTAINERS

This new LFW 603-C, mounted on a White Mustang, was produced to handle scrap metal storage containers. It will handle containers in capacities up to 15 cu. yds. in all Dempster-Dumpster models. Lifting capacity is 18,000 lbs. Dempster Brothers, Inc., Knoxville, Tenn., offers a catalog brief No. 160 describing this and other materials handling systems.

PORTABLE FUEL OIL TANKS

This 2,000-gallon tank was produced for operation at temperatures as low as −90° F. It features its own pump and gasoline engine. Prime mover is a truck-mounted Dempster-Dinosaur which hydraulically lifts the tank into carrying position and puts it off. A new catalog section No. 12 describes the development. Dempster Brothers, Inc., Knoxville 17, Tenn.

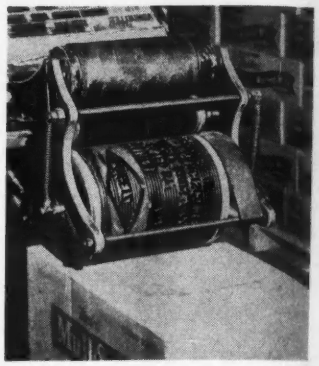
Advertisement

packaging

Eliminate hand stenciling

At the Borden's Little Valley, New York plant, continuous movement of the cartons on the conveyor line had to be slowed down to allow hand stencilers to catch up with the output of the automatic packaging equipment.

Now with the aid of an in-line automatic No. 6 Auto-Printer, the cartons are marked as they leave the sealing machine and keep pace with the sealer's output.



Friction between the moving carton and the automatic marking head starts the marking cycle. The head turns one revolution to a positive stop, ready for the next package

Supplier: The No. 6 Auto-Printer is manufactured by Industrial Marking Equipment Company, Inc., 655 Berriman St., Brooklyn, New York.

6804 on Reader Service Slip.

Miniature imprinter prints 120 units per min

The imprinter is especially designed to fit within the limited space of form-fill-seal pouch and wrapping machines. Measuring only 4½"x5¼"x6", it will imprint codes and/or prices up to 1"x1".

Impressions are effected by means of heated type applied to colored leaf. Method is suitable for polyethylene, polypropylene, waxed paper, films, foils and papers.

Supplier: Adolph Gottscho, Inc., Hillside 5, N.J.

6805 on Reader Service Slip.

that's interesting

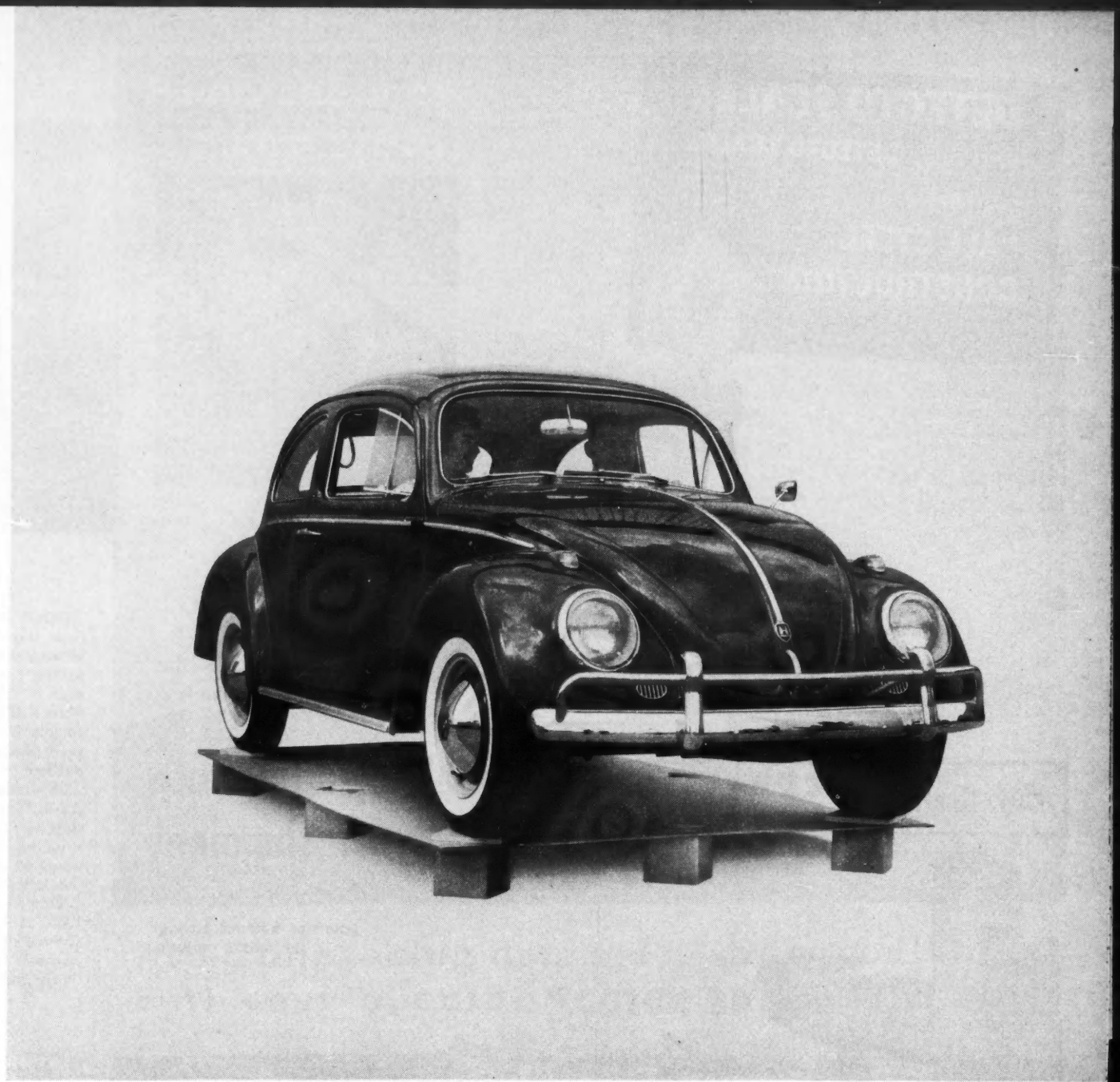
Atom-age 'K-Ration'

A whole-grain wheat wafer developed and tested by USDA scientists as a compact, long-keeping emergency ration for stockpiling in fallout shelters, is the size of the average cookie, and has an estimated shelf life of at least five yr.

Each wafer furnishes 84 calories. In a shelter test involving 100 service volunteers, 12 wafers per day supplied a little more than half the day's 2000 calories (adequate for shelter purposes) and about a third of the protein. Milk and peanut butter supplied the rest of the protein.

Needed next are more exact knowledge of nutritional needs in fallout shelters, more variety in the wheat wafer diet, and additional research on production and packaging methods.

For more information on product at right, circle 6806 see information request blank opposite last page.



HOERNER CORRUGATED PALLET HOLDS A 'VOLKS' AND ITS FOLKS

This new Hoerner pallet, made entirely of corrugated, holds a 1631 pound Volkswagen and its occupants. Total: 1981 pounds. Sound amazing? Well, pardon our immodesty but we think it is. Even more amazing is the way the posts support the pallet: with, what Hoerner design engineers call, "friction fit;" without glue or staples. The pallet is shipped knocked-down and is easily assembled. It's disposable; there are no return costs; and its initial cost is also less. This pallet is one of Hoerner's unique applications of corrugated, an application a Hoerner packaging engineer will be glad to demonstrate. (Designing and building better corrugated containers for everyday items is, of course, much simpler.)

HOERNER BOXES, INC.
CORRUGATED PACKAGING SPECIALISTS

GENERAL OFFICES: 600 Morgan Street, Keokuk, Iowa • MILL: Missoula, Montana • PLANTS: Fort Smith and Little Rock, Arkansas; Danville and Waukegan-Gurnee, Illinois; Des Moines, Keokuk and Ottumwa, Iowa; Minneapolis, Minnesota; Tupelo, Mississippi; Springfield, Missouri; Sand Springs, Oklahoma; Sioux Falls, South Dakota; Fort Worth and Mission, Texas • ASSOCIATE: Cajas y Empaques Impermeables, S.A., Mexico City D.F., Mexico

DETECTO SCALES

and only **DETECTO SCALES**

can say

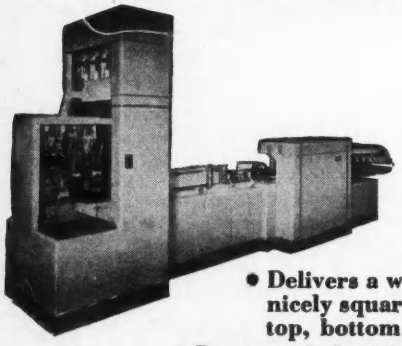
"ALL STEEL CONSTRUCTION"

Write for information on full line of industrial weighing equipment from 1/100 oz. to 100 ton:

DETECTO SCALES, INC.
Dept. K-4, 540 Park Ave.
Brooklyn 5, N. Y.

6807 on Reader Service Slip.

Cut Costs with SEALTITE



- **Delivers a well settled, nicely squared bag at top, bottom and sides**
- **Pre-scored, double fold, uniformly glued seal keeps product in and dirt out**
- **Uses any standard make of gusseted bag — no royalties**
- **Seal readily opened, yet tamper-proof**
- **Seals 30 to 50 bags per minute**
- **Users report costs reduced up to $500.00 per month per machine**

Write for complete information

CONSOLIDATED PACKAGING MACHINERY CORP.
A Subsidiary of International Paper Company
BUFFALO 13, N. Y.

6808 on Reader Service Slip.

Lettuce is inspected and heat-sealed wrapped at one of the six wrapping stations carried by the machine ▶

After wrapping and sealing, lettuce package is passed through a shrink tunnel and cartoned. The cartoned lettuce is then rushed to vacuum coolers and from there into iced cars for market shipment

"Breathing" polystyrene film makes it possible to

Field wrap lettuce for shipment

potential $20 mil savings for lettuce industry

ABOUT 30% of lettuce shipped from the Western states is lost in trimming before it is sold to the consumer. This means that of the 101,204 carlots of lettuce shipped in 1960, 30,000 carlots were waste leaf wrappers costing the industry $20 million.

To eliminate this waste, Bud Antle, Inc., a large grower-shipper in California is now shipping trimmed lettuce wrapped in film which keeps the lettuce in fresh condition.

This film, known as Trycite 1000, is a "breathing" polystyrene film developed for this purpose. The film has a relatively high permeability to

Self-propelled machine follows harvesting crews who cut lettuce from the field, eliminate waste leaves and deliver to wrapping stations

fp PACKAGING

oxygen, carbon dioxide and water vapor.

Tests and field experiences at Bud Antle have demonstrated that Trycite keeps lettuce fresh and crisp during its subsequent handling and 7-10 day travel to Eastern cities.

Harvesting crews now trim lettuce in the field and pass it onto a self-propelled inspecting and wrapping machine shown in the photo.

Information about Trycite can be obtained from Dobeckmun, a division of the Dow Chemical Co., 3301 Monroe Ave., Cleveland 13, Ohio.

6809 on Reader Service Slip.

Avoid unpacking damage . . . order containers with easy-opening SCOTCH BRAND tear strip

Be sure your product makes it all the way to the grocers' shelves looking neat . . . undamaged . . . inviting sales. Avoid the ripping, gouging, slicing of the stockboy's knife. Choose containers with clean-cutting tear strip tapes. "SCOTCH" BRAND Tear Strip Tape makes your container the grocers' favorite "fast opener." It's easy. It's safe. It stops damaged goods. It makes for 41% faster shelf stocking. 45% faster pricing. And "SCOTCH" BRAND Tear Strip Tape works perfectly . . . 1000 times out of 1000.

Add this extra appeal to your containers. Talk today with your container supplier, your 3M Representative or nearest "SCOTCH" BRAND Tape Distributor . . . or write: 3M Co., 900 Bush Avenue, St. Paul 6, Minnesota, Dept. IBC-121.

MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.

6810 on Reader Service Slip.

KLENZADE

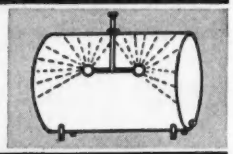
IN • PLACE Spray Cleaning FOR THE FOOD PROCESSING INDUSTRIES

New Cleaning Techniques Save Time – Cut Costs

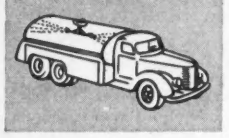
Processing Vats—in-place spray cleaning or portable units for batteries of similar vats.

KLENZADE MODERN

Storage Tanks — complete systems for pipeline cleaning and in-place spray cleaning.



CLEANING AIDS



Over-the-Road Tanks — in-place spray cleaning for haulers of lard, edible oils, liquid eggs, liquid sugar, etc.

Recirculation Cleaning

Complete semi or fully automatic systems for cleaning and sanitizing pasteurizers, evaporators, vacuum pans, pressure cookers, high temperature equipment.

Write for Descriptive Literature

KLENZADE PRODUCTS, INC.

Systematized Sanitation All Over the Nation

Dept. 31M BELOIT, WISCONSIN

6811 on Reader Service Slip.

packaging

Jumbo size container for pressurized foods

"Large economy size" for consumers may be the result of the introduction of a 24 ounce pressurized food container.

The large-sized container holds approximately 50% more product than the present 16 ounce pressure container, making it possible to reduce unit selling price per ounce.

Diameter of new pressure container is only fractionally larger than present 16 ounce size

Supplier: American Can Company, 100 Park Ave., New York 17, N.Y.

6812 on Reader Service Slip.

Perforated shrink film permits "breathing"

The first perforated shrinkable film is commercially available for use with produce requiring a breathing film to maintain quality.

Reynolon PVC is produced in a patented process which makes it possible to perforate the polyvinyl chloride film with minute reinforced holes without losing strength. No tearing will originate at the perforations because of this reinforcement.

The film was designed for produce packing, which requires a breathing film to maintain quality.

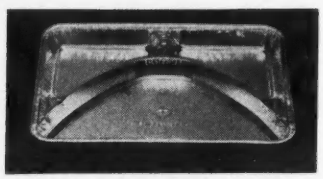
Information regarding Reynolon PVC can be obtained from Reynolds Metals Company, Reynolds Metals Building, Richmond 18, Virginia.

6813 on Reader Service Slip.

Built-in perforations, invisible to the naked eye, preserve the quality of produce by allowing them to "breathe"

Aluminum foil tray speeds packing

The existing "T" shape yoke dinner tray containers slow down packing in the frozen dinner industry because of limited space in the sections.



Structural design of the container increases strength

Oval shape designed containers recently introduced make location of hard-to-place ham slices and salisbury steaks easier, and gravy can be dispensed at higher speeds.

Supplier: Ekco-Alcoa Containers Inc., Wheeling and Hintz Roads, Wheeling, Illinois.

6814 on Reader Service Slip.

Describes features of rotary piston fillers

Detail photographs, operating economies and mechanical features of "Votator" rotary piston fillers for liquid or viscous foods are described in a 12 page brochure, No. PED-274, by the Girdler Process Equipment Division of Chemetron Corporation.

6815 on Reader Service Slip.

Quick-change mounting plate facilitates multiple use of Viberlec vibrator.

Speed the flow of bulk materials!

Viberlec Vibrators increase production...lower operating costs!

Most efficient and economical movement of bulk materials is provided by Viberlec electric external vibrators—from the finest powders to large solid pieces—through bins, chutes and hoppers.

Compact, powerful Viberlec vibrators offer many advantages:

- Practically silent operation – little or no annoyance to employees.
- Vibrated material may be hot or cold, under pressure, vacuum or controlled humidity. It may be sterile, toxic or protected by an inert atmosphere.
- Operating parts, sealed in steel are *not* affected by dust, moisture, water, humidity, corrosive or contaminated air.
- Rugged construction for years of service.

10′ cord and switch with thermal overload protection are included.

WRITE TODAY for full information!

VIBER COMPANY 726 S. Flower St. Burbank 57, California

VIBER CO

Pioneers and leaders in the manufacture of

VIBRATORS

6816 on Reader Service Slip.

that's interesting

Cranberry output bogs!

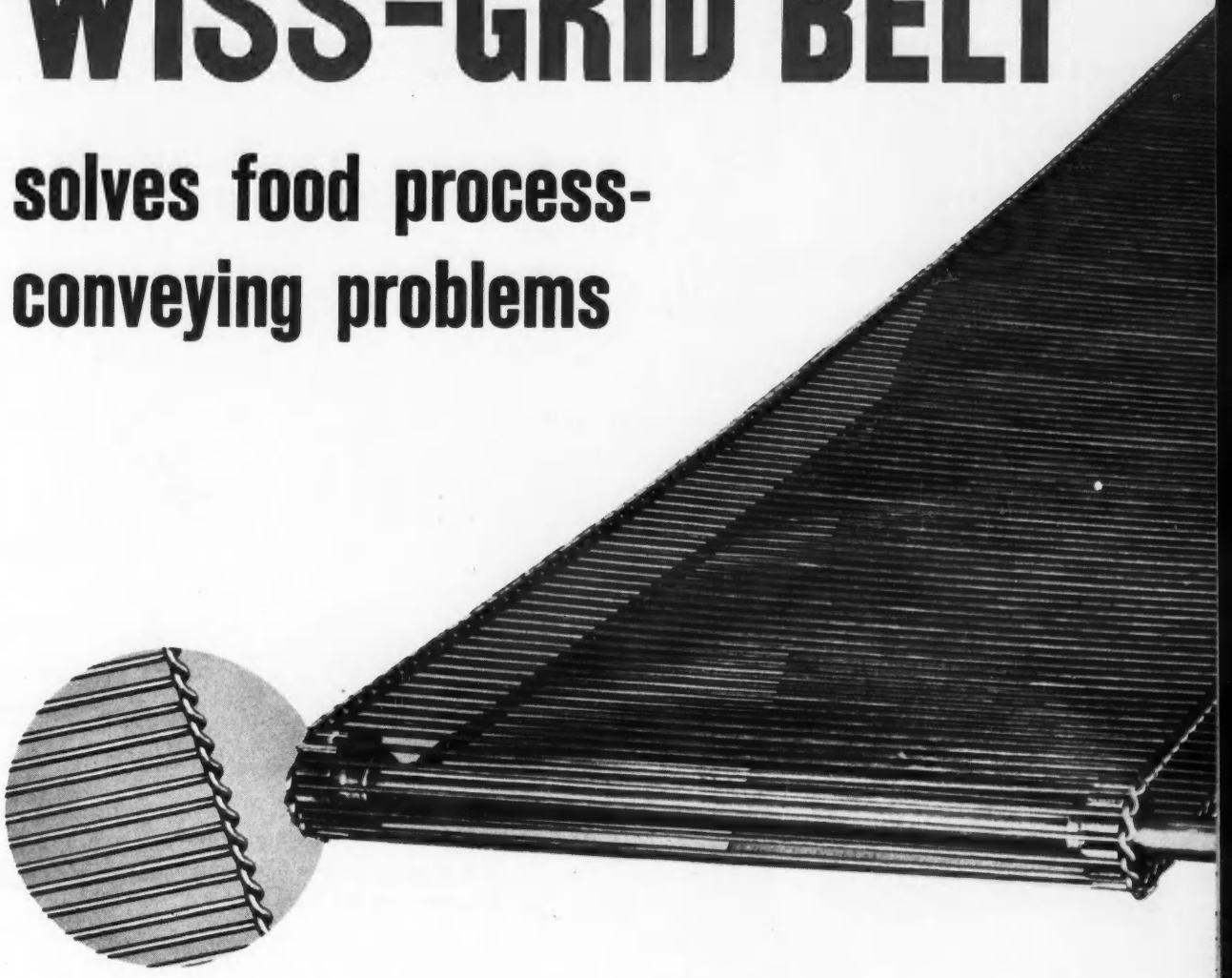
A shortage of cranberry sauce for the holiday season is probable, with a crop roughly 150,000 barrels under last year's-due principally to weather difficulties involving the important Cape Cod crop. Sales volume, on the other hand, is expected to be well above that of 1960, and understandably vastly higher than that of 1959 — the cranberry scare year.

Tin can treasure

Our attitude toward the metal can is similar to the attitude of the ancient Aztecs toward gold. They had lots of it, used it functionally, took it for granted and put an extraordinary monetary value on it. It took the conquering Spaniards to register astonishment at the fabulous wealth that lay all about the Aztec cities. That's about the way the most sophisticated foreigner feels today when he enters a modern American supermarket and surveys the wealth of food in metal cans.

WISS-GRID BELT

solves food process-conveying problems



Wiss-Grid—the newest member of CF&I-Wissco's complete line of processing belts—is . . .

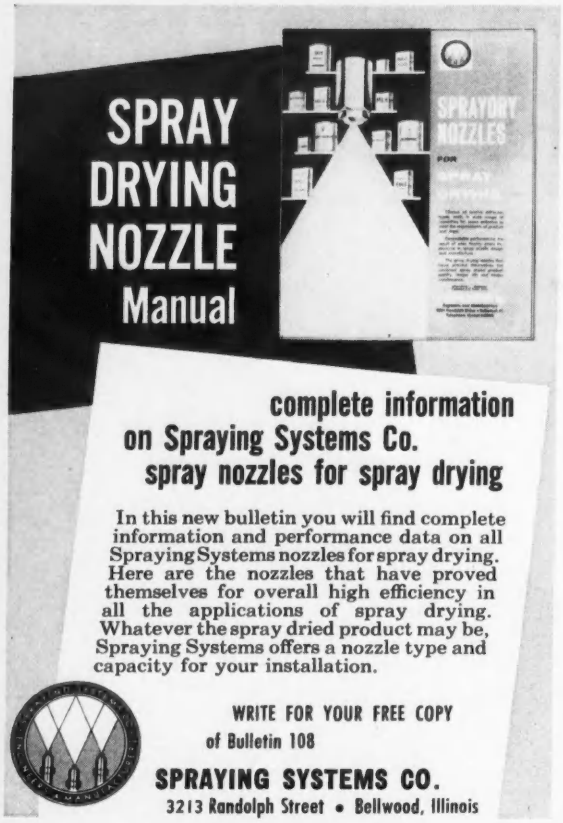
- Especially recommended for continuous processing of baked goods and confections, in 2, 3, and 4-tier ovens, and in many other food processing applications.
- Extremely flexible and sturdy, and provides long-lasting service on conveyors with centers not exceeding 40 feet.
- Easy to clean because particles won't cling to the round. smooth wires.
- Supplied in either straight-line, single pitch or curved, multiple pitch sections.
- Designed for use on sprockets of ½″ pitch, with pitch diameters of 2″ or larger.
- Available from stock in 12″, 18″ and 24″ widths; other sizes upon request.
- Furnished in carbon steel with galvanized or tinned finish, and Type 304 Stainless Steel. Sprockets are available in cast and ductile iron or stainless steel.

CF&I engineers will be happy to study your operation and recommend the Wiss-Grid Belt that will reduce your equipment downtime and increase your production. Send for your copy of the Wiss-Grid specification sheet: Wickwire Spencer Steel Division, Woven Wire Products Sales Department, P. O. Box 311, Palmer, Mass.

CF&I STEEL
MADE IN U.S.A.

The Colorado Fuel and Iron Corporation
Denver • Oakland • New York
Sales offices in Key Cities

6817 on Reader Service Slip.


SPRAY
DRYING
NOZZLE
Manual
SPRAYDRY NOZZLES
FOR
complete information
on Spraying Systems Co.
spray nozzles for spray drying
In this new bulletin you will find complete information and performance data on all Spraying Systems nozzles for spray drying. Here are the nozzles that have proved themselves for overall high efficiency in all the applications of spray drying. Whatever the spray dried product may be, Spraying Systems offers a nozzle type and capacity for your installation.
WRITE FOR YOUR FREE COPY
of Bulletin 108
SPRAYING SYSTEMS CO.
3213 Randolph Street • Bellwood, Illinois

6818 on Reader Service Slip.

A BETTER CLOSURE
for SMALL PAPER BAGS
UNION SPECIAL'S Style 60000 D Bag Closing Machine, producing the exclusive Dubl-Tape closure, is designed to speed packaging . . . cut costs . . . and improve appearance.
• FAST—Speed to match output of standard filling and weighing equipment.
• NEAT—Produces an eye-pleasing, sales-stimulating package with high merchandising value.
• ECONOMICAL—Operating cost per bag is at a minimum . . . uses inexpensive cotton thread and paper tape.
• VERSATILE—Adjustable for a wide range of bag sizes, short or long runs.
Write for BULLETIN No. 100 to get the complete facts on this machine . . . and how it can do a better closing job for you.
UNION SPECIAL
Dubl-Tape CLOSURE
Union Special®
MACHINE COMPANY
432 N. Franklin St., Chicago 10, Ill., U.S.A.
FINEST QUALITY
BAG CLOSING MACHINES

6819 on Reader Service Slip.

Gusset bags stack better than tube-type bags

Design changes in the bags made the company's diamond recognition symbol and products readily identifiable

Supplier know-how and use of gusset bags for the first time in the dry milk industry . . .

Pares bag costs ⅓

GALLOWAY-WEST CO., Fond Du Lac, Wisc., one of the nation's leading manufacturers of dry milk products not only has a new impressive appearing package but effected a reduction of 1/3 of that of the original bag costs.

Responsible for the change were the packaging experts from Union Bag-Camp Paper Corporation. When consulted they recommended that tube-type bags which Galloway-West was using be replaced by a gusset-type bag.

This marks the first time the use of gusset bags in the dry milk industry.

Gusset-styled bags were recommended because they fold out into rectangular sides and ends, which present neater warehousing and better appearance than the tube-type bags. During filling, the rectangular bottom is more stable than tube bags, which stand on edge.

The change to the gusset also enabled a shorter package of two inches with the same amount of paper. Standardization and change from flat kraft to stronger extensible kraft eliminated 40 pounds of paper per ream for the production of bags, contributing to the cost reduction.

It is interesting to note Galloway-West pioneered the switch from crinkle kraft to flat kraft bags in the dry milk industry, and were the first to offer their product in 50 pound sizes at no premium cost over the 100 pound size.

Supplier: Union Bag-Camp Paper Corporation, 233 Broadway, New York 7, N.Y.

6820 on Reader Service Slip.

High-yield cellophane resists grease

Bread-wrapping cellophane, yielding 25,000 square inches per pound, is now available below the cost of the film it replaces.

The film, known as 250 "V" cellophane, was designed to provide better dimensional stability during temperature changes. It resists puckering and wrinkles when in contact with grease.

This polymer-coated 250 "V" film provides extra aroma and flavor retention.

This film is also suitable as a direct wrap for cup cakes and sliced cake.

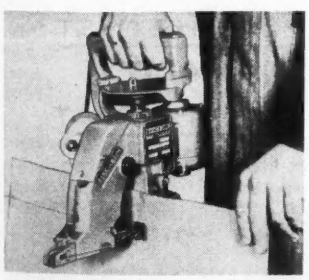
Information regarding 250 "V" cellophane can be obtained from the Packaging Division of Olin Mathieson Chemical Corporation, 460 Park Ave., New York 22, N.Y.

6821 on Reader Service Slip.

Closes all types of textile, paper bags

Portable bag closer, offering great adaptability to a wide range of bag closing applications, will handle all types and thicknesses of textile and paper bags.

The unit may be used as a completely portable machine,



Portable bag closer may be used efficiently by totally inexperienced operator

or in one position with specially designed suspension units. It can also be operated with special attachment for applications where tape bound closures are required.

Supplier: Dave Fischbein Company, 2720-30 Avenue S, Minneapolis, Minn.

6822 on Reader Service Slip.

How Neptune Syrup Meter

PAID OFF TWO-TO-ONE

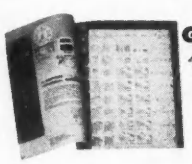
in first year at J. Hungerford Smith

By permitting purchases of caramel color at tank-car prices, a complete storage and metering system paid for itself twice over in materials costs alone during the first summer. And this is only part of the savings made by J. Hungerford Smith Company, manufacturer of fine root beer flavors.

Formerly, the caramel color was purchased in drums, requiring much man-handling and storage space. It took a man full time to measure the syrupy material with buckets. Now it takes only a few seconds for each batch. The operator simply sets up the Auto-Stop and opens the valve. The meter does the rest... shuts off automatically at the exact quantity required by the formula. The meter even turns the pump on and off.

Biggest advantage of all, according to Mr. W. Carvel Martin, plant manager: "It takes the guesswork out of the formula."

You can make savings like this in your plant.



GET THE FACTS
Ask for helpful Meter Data Bulletin 566 LFP See Neptune Data Pages in Chemical Engineering Catalog.

neptune

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NEPTUNE METER COMPANY
LIQUID METER DIVISION
47-25 34th St., Long Island City 1, N.Y.

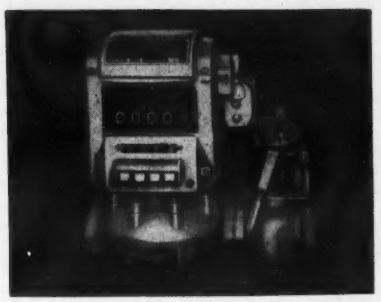
6823 on Reader Service Slip.

Auto-Switch Meter Controls Pumps, Valves, Relays

Neptune Auto-Switch register features an explosion-proof switch which is actuated automatically when any desired quantity of liquid has passed through the meter. The switch can be used to turn pumps on or off, actuate solenoid valves, start agitators, or control other cycling operations by use of suitable relays, etc. which can be devised.

The Auto-Switch feature is available either with or without the mechanically coupled Auto-Stop valve.

In a typical example using the Auto-Switch Register with Auto-Stop valve, the operator clears the



register back to zero, and sets the register for the required number of gallons or pounds of liquid ingredient to be delivered to a kettle or mixing tank. He then opens the coupled Auto-Stop valve to start the cycle. This also closes (or opens) the switch. When the desired quantity has been delivered, the meter automatically trips the valve shut, and at the same time actuates the electric switch.

Gauge-Stick Errors of ⅛ in. Can Cost Thousands of Dollars

Inaccurate liquid measurements can add up to thousands of dollars a year in wasted materials, time, effort, to say nothing of lowered quality.

For instance, it's a tough job to read a gauge stick down inside a 4-ft. tank, particularly when the tank is being filled with hot steamy liquids, or when the liquid is swirling around. Yet an error of just ⅛ in. means that *one gallon too much or too little* has gone into the tank. This *can* add up to thousands of dollars in wasted batches in the course of a year's production.

For formula-perfect batches time after time, get rid of the stick and put a Neptune Auto-Stop meter in every liquid line leading to the blending tank or kettle.

"THIS LUBRICANT REDUCES SERVICE CALLS"

—says LYNCH CORPORATION
Toledo, Ohio

"LUBRIPLATE greatly reduces unnecessary wear and prolongs the life of machines. It has reduced customer calls for service to a minimum. Our Service Engineers can readily spot machines that have had other than LUBRIPLATE Lubrication, as these machines do not give the service they should."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

6824 on Reader Service Slip.

technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Key numbers in the last line will help to locate these reviews, which are numbered in sequence. Items followed by (†) indicate literature offered by advertisers — see Advertisers Index, page 119.

Processing, Equipment, Accessories

Data, worked examples help you figure heating and cooling*, 26 pp, (Bul 356), Dean Products, Inc.
6768 on Reader Service Slip.

Custom grinding service uses liquid nitrogen to handle problem materials without oxidation, flavor loss*, 4 pp, Liquid Nitrogen Processing Corp.
6782 on Reader Service Slip.

Wiped-film evaporator operation, maintenance detailed in bulletin*, 8 pp, (Bul 1006), Pfaudler Div., Pfaudler Permutit, Inc.
6769 on Reader Service Slip.

Nozzles, spray drying, for variety of products and capacities†, (Bul 108) Spraying Systems Co.
6825 on Reader Service Slip.

Double-drum dryers that can be used with baby cereals†, (Fact sheet on Heinz dryer installation; Cat 384 on dryer lines; Cat 381 on laboratory service) Buflovak Equipment Div., Blaw-Knox Co.
6826 on Reader Service Slip.

Dryers that increase production while minimizing fuel†, (Lit) The Heil Co.
6827 on Reader Service Slip.

Drying nozzles with tungsten-carbide orifice for better performance†, (Cat SD-1 and SD-2) Delavan Mfg. Co.
6828 on Reader Service Slip.

Steam-jacketed kettles, tanks and filters for wide variety of food products†, (Steam-jacketed kettles bul; Tanks & Filters Cat 2512) Groen Mfg. Co.
6829 on Reader Service Slip.

Ammonia compressors and boosters, 2, 4 and 6 cylinder models; ice builders; flow diagram in color, 6 pp, (Bul V-18) The Creamery Package Mfg. Company
6830 on Reader Service Slip.

Double spiral ribbon blender with removable ribbon assembly assures thorough mixing, easy cleaning, 4 pp, (Brochure) Munson Mill Machinery Co.
6831 on Reader Service Slip.

Ingredients, Food Additives

Wheat gluten for addition of protein without change in flavor†, (Lit and samples) The Keever Starch Co.
6832 on Reader Service Slip.

Sodium acid pyrophosphate leavening agents, made in wide range†, (Refrigerated Biscuit Report; S.A.-P.P. samples; lit on phosphates) Mineral Products Div. FMC Corp.
6833 on Reader Service Slip.

Fruit flavors, pure concentrated juices or with other natural flavors†, (Flavor samples & Lit) Flavorex Co., Inc.
6834 on Reader Service Slip.

Hydrolized, vegetable-protein flavoring agent specially stabilized to withstand high temperatures†, (HPV-Prozate Lit & Sample) Hercules Powder Co.
6835 on Reader Service Slip.

High maltose, low dextrose corn syrup, 6 pp, (Folder) Corn Products Sales Co.
6836 on Reader Service Slip.

Instant dough development of yeast-raised doughs*, 4 pp, (Redi-Sponge Bul) Western Condensing Co.
6742 on Reader Service Slip.

Packaging, Labeling, Cartoning

Votator rotary piston fillers*, 12 pp, (Brochure No. P E D-274) Chemetron Corp.
6815 on Reader Service Slip.

Forming machine sets up, heat seals cartons or trays up to 150 per min†, (Lit) Hayssen Manufacturing Co.
nlad
6837 on Reader Service Slip.

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Miniature imprinter designed for form-seal-wrapping machines*, (Bul RAP-3). Adolph Gottscho
6805 on Reader Service Slip.

Automatic in-line marker eliminates hand stenciling*, Ind Marking Equip. Co., Inc.
6804 on Reader Service Slip.

Can-closing machines of simplified, efficient design†, Sanitary Can Machine Co.
6839 on Reader Service Slip.

Seals any standard make of gusseted bags at speeds of 30 to 50 bags/min†, (Lit) Consolidated Packaging Machinery Corp.
6840 on Reader Service Slip.

Tear-strip tape for easy, safe opening of cartons†, (Lit) Minn. Mining & Mfg. Co.
6841 on Reader Service Slip.

Fills jars, cans at high speeds with accurate head space†, (Lit) Pfaudler Permutit, Inc.
6842 on Reader Service Slip.

Bag closing machine for small paper bags is fast, versatile†, (Bul 100) Union Special Machine Co.
6843 on Reader Service Slip.

Bulk Handling and Accessories

Vibrating conveyors, powered by air, for powders, granular and chunky materials†, The Cleveland Vibrating Co.
6844 on Reader Service Slip.

Vibrators, electric, have external quick-change mounting plates for multiple use†, (Lit) Viber Company
6845 on Reader Service Slip.

Separation magnets, oil-filled and suspended — where and how to use them, 6 pp, (Bul 1032) Stearns Magnetic Products
6846 on Reader Service Slip.

Conveyors, Racks, Accessories

Wire belting for food conveying, processing, made in straight-line, single pitch or curved, multiple pitch sections†, (Spec Sheet) Wickwire Spencer Steel Div., The Colorado Fuel and Iron Corp.
6847 on Reader Service Slip.

Wire cloth from any metal or alloy in nine basic weaves†, 120 pp, (Cat) The Cambridge Wire Cloth Co.
6848 on Reader Service Slip.

NEW '62 HEIL DRYERS!

15% more production with no fuel increase
25% more production with modest fuel increase

New 1962 Heil dryers are more efficient than ever. With greatly improved utilization of the drying medium, you can dry 15 percent more material with no increase in fuel consumption — 25 percent more with only a modest increase in fuel.

For over 30 years, Heil dryers have been the standard of comparison—in fuel economy, effectiveness of drying, quality of finished product and compact construction. Now — for '62 — you get a better value than ever! Wire, write or call for the complete story.

HEIL Quality PRODUCTS

THE HEIL CO.

MANUFACTURERS OF THE ARNOLD DRYER

3000 West Montana St., Milwaukee 1, Wisconsin

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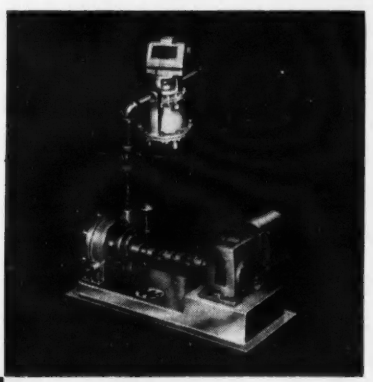
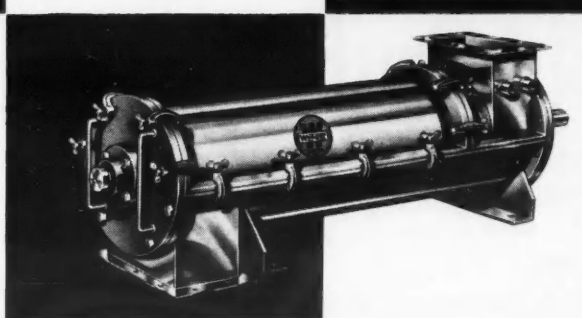
LIQUID HANDLING OR APPLICATION PROBLEMS?

Interested in a metering pump which delivers an absolutely even flow of liquid (any liquid) from a few ounces to 14 gallons per minute without surges?



Or a continuous hi-speed liquid blender (capacities 2—40 tons per hour)—available with a variety of variable speed feeders for dry ingredients?

Or liquid conditioning feeders? Package model feeders, pump and mixer? Multi-blenders? Batch mixers? Continuous expansion cookers for cereal products? Tunnel type driers or coolers?



If so, a note or call to Wenger—the firm with a quarter century of experience—will bring details.

Wenger

Wenger Mixer Mfg. Sabetha, Kansas
Phone: AV 4-2133
Industrial Division: 1802 Fed. Res. Bank Bldg., Kansas City, Mo.
Phone: BA 1-5084 • CABLES: WENGERMIX

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CLEVELAND VIBRATING CONVEYORS
POWERED BY AIR . . .

WITH THESE ADVANTAGES:

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- Stainless or Aluminum Trough
- One Moving Part
- Accurate Flow Control
- Automatic Lubrication
- No Tuning of Supports
- Open or Closed Systems
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Write today for information and prices.

THE CLEVELAND VIBRATOR CO.

2818-12 Clinton Ave. • Cleveland 13, Ohio

3874-CV

6851 on Reader Service Slip.

Conveying products at low, sub-zero temperatures... that's a job for TON-TEX Kold-Pruf BELTING

- The Ton-Tex Corporation now offers an amazing *new* Conveyor Belt for "cold-room" service where frigid, hard-freezing temperatures run far below zero. Whether the service is "totally-in" or "in-and-out" KOLD-PRUF will operate more efficiently and last longer.
- KOLD-PRUF is an ideal belt to use on low-temperature refrigeration or deep-freeze installations, and in dry ice and ice cream manufacturing plants. It is made of plies of selected cotton duck welded together with special compounds so as to withstand the rugged service demanded. Even at low temperatures, KOLD-PRUF remains unusually flexible, and the friction heat developed in operating is sufficient to maintain pulley-grip and prevent belt slippage.
- Got a "cold-room" conveyor belt problem? Without obligation let our Engineering Department explain what KOLD-PRUF BELTING can do for you.

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.

31 COLUMBUS AVENUE, ENGLEWOOD, NEW JERSEY — 1180 AUZERAIS AVENUE, SAN JOSE 26, CALIFORNIA

TON-TEX CONVEYOR AND TRANSMISSION BELTING

6852 on Reader Service Slip.

new literature

Overhead track scales, snallow and deep pattern, have fast-reading dials and weight recorder, 8 pp, (Bul 8006) Fairbanks, Morse & Co.
6853 on Reader Service Slip.

Fork Trucks and Accessories

Engines for fork-lift trucks, attain power and performance with economy, 8 pp, (Cat Bu-650) Allis-Chalmers Mfg. Co.
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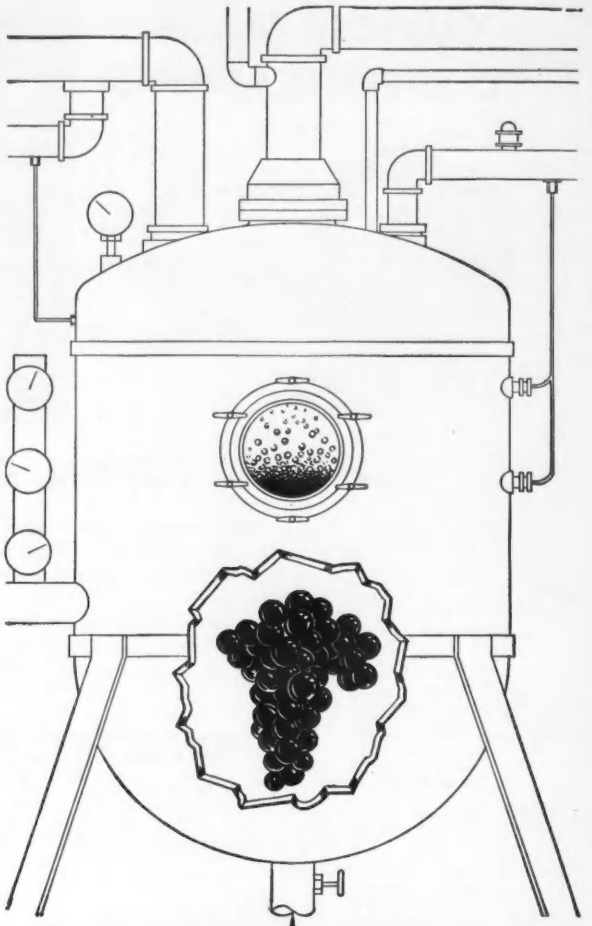

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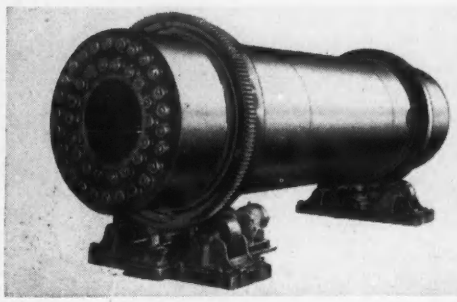

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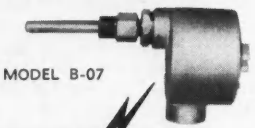

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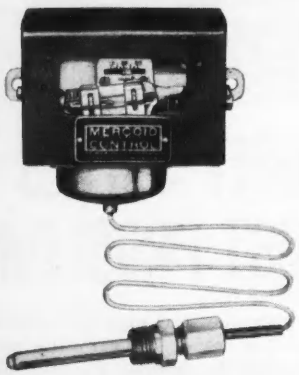

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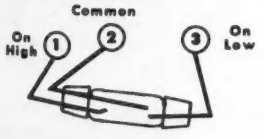

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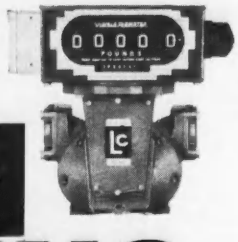

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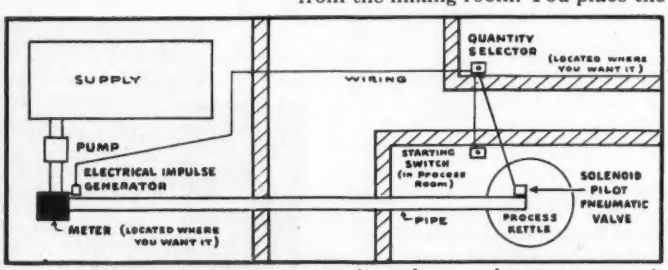

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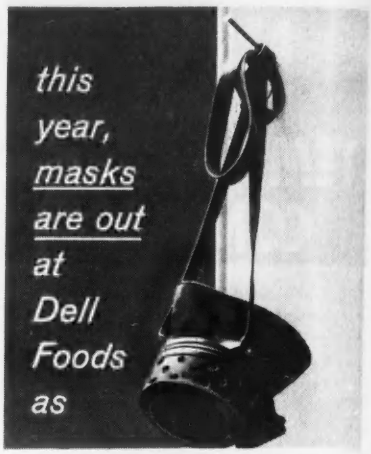

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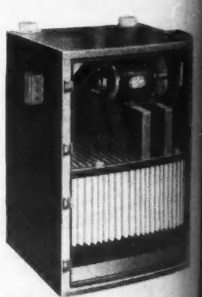

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6684	6722	6760	6798	6836	6874
6685	6723	6761	6799	6837	6875
6686	6724	6762	6800	6838	6876
6687	6725	6763	6801	6839	6877
6688	6726	6764*	6802	6840	6878
6689	6727	6765	6803*	6841	6879
6690	6728	6766	6804	6842	6880
6691	6729	6767*	6805	6843	6881
6692	6730	6768	6806	6844	6882
6693	6731	6769	6807	6845	6883
6694	6732	6770	6808	6846	6884
6695	6733	6771	6809	6847	6885
6696	6734	6772	6810	6848	6886
6697	6735	6773	6811	6849	6887
6698	6736	6774	6812	6850	6888 BACK COVER
6699	6737	6775	6813	6851	
6700	6738	6776	6814	6852	
6701*	6739	6777	6815	6853	
6702	6740	6778	6816	6854	
6703	6741	6779*	6817	6855	
6704*	6742	6780	6818	6856	
6705	6743	6781	6819	6857*	
6706	6744	6782	6820	6858	
6707	6745	6783	6821	6859	

Multiple Listings

for items with*

Key No.	Description

No. 38725

Please type or print and be sure to give your title and main product of Company

Name ..... Title .....

Company ..... Main Product .....

Street Address of Company .....

City ..... Zone No. ..... State .....

Be Sure To Give Your Address

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DECEMBER 1961

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As you read editorial articles and advertisements which interest you, on which you'd like more information . . . note key number under each and circle this number below. Then fill in your name, title, company, main product and address at the bottom of this sheet and mail . . . no postage, no envelope necessary. Information will come to you direct, without obligation.

Expiration date for these numbers is March 10, 1962

6670	6708	6746	6784	6822	6860
6671	6709	6747	6785	6823*	6861
6672	6710	6748	6786	6824	6862
6673	6711	6749	6787	6825	6863
6674	6712	6750	6788	6826*	6864
6675	6713	6751	6789	6827	6865
6676	6714	6752	6790	6828	6866
6677	6715	6753	6791	6829*	6867
6678	6716	6754	6792	6830	6868
6679	6717	6755*	6793	6831	6869
6680	6718	6756	6794	6832	6870
6681	6719	6757	6795	6833*	6871
6682	6720*	6758	6796	6834	6872*
6683	6721	6759*	6797	6835*	6873
6684	6722	6760	6798	6836	6874
6685	6723	6761	6799	6837	6875
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Name ..... Title .....

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Street Address of Company .....

City ..... Zone No. ..... State .....

that's interesting

International symbol

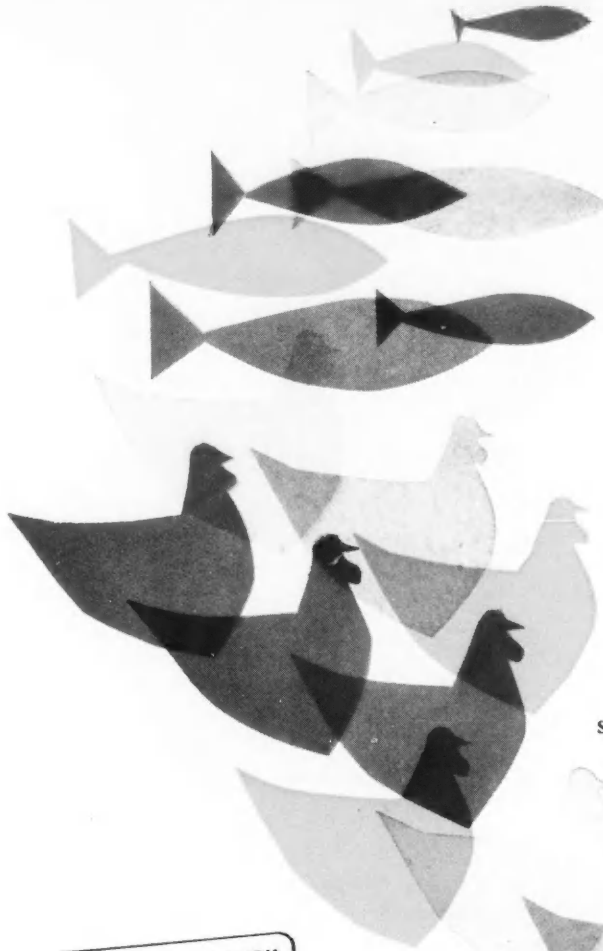
The prosaic "tin" can has become an international symbol — speaking to all men in a language each can understand. In the U.S., it symbolizes convenience, product variety and a means of mass distribution. Overseas, however, the can is understood in much more intimate terms — as the source of food and life in a daily battle against hunger.

Ageless truth

Radioactivity has been used to prove the age of distilled spirits. Scientists have built an "atomic clock" with which to show that spirits bottled before the era of nuclear explosions contain less radioactive tritium than those bottled later.

For more information on product at right, circle 6887 see information request blank opposite last page.

MORE THAN A SUBSTITUTE



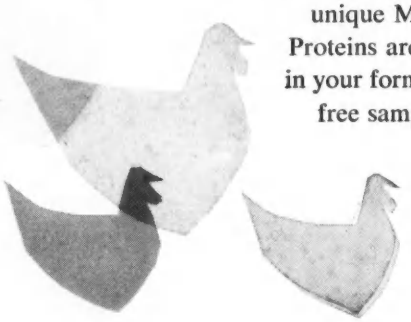
HERE'S ONE THAT'S BOTH FISH and FOWL

Here's an ingredient that gives you *everything* in the way of clearer, cleaner, better flavor for fowl and sea food products – new Maggi's Hydrolyzed Plant Protein 3H-3.

A *basic* flavor, always uniform, unaffected by processing and unusually economical, Maggi's 3H-3 never varies in taste or quality, has been proved by leading processors.

Like the entire Maggi's Hydrolyzed Plant Protein series – for beef, veal and pork, too – 3H-3 makes a marked contribution to the desired flavor without adding other flavor characteristics.

The technologists who developed these unique Maggi's Hydrolyzed Plant Proteins are available to assist you in your formulations. Write for free samples and data.



FOR VEAL and PORK

Maggi's Hydrolyzed Plant Protein 3-H1 is designed particularly for use in veal and pork products. Clear and clean as well, it provides a medium-strength meaty background and is light in color.

FOR BEEF FLAVOR – MAGGI's 4-BE and 4-BE-2
Available in Liquid, Paste or Powder form

MAGGI's®
HYDROLYZED PLANT PROTEINS

Prepared by the makers of world famous MAGGI's *seasoning*

THE NESTLÉ COMPANY, INC.
WHITE PLAINS, N. Y.

What can lemon juice do for mayonnaise?

Exchange Lemon Juice, blended with vinegar, produces higher active acidity in the water phase (and lower in the oil phase) without excessive acid odor. It extends shelf life by improving emulsion stability and reducing tendency to go rancid. Constituents in lemon juice will tie up metallic ions (such as copper and iron) which attack fatty oils of the emulsion.

...for barbecued beans?

Lemon juice enhances flavor. Used in the barbecue sauce, it is most effective in adjusting acidity. The true taste of the beans is heightened. And, of course, the addition of lemon juice adds a saleable distinction to your label.

...for your product?

Send us the coupon today—and let our researchers tell you what lemon juice can do for you.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

GENTLEMEN: *Our product is* _____

_____ *How can lemon juice help*

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